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TECHNOLOGY FOR BUSINESS

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ON THE COVER

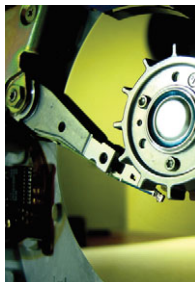
Maximize Your Storage

Solving the perplexing problem of dwindling storage space is quickly growing into a tricky science for businesses of all sizes. When a business encounters an apparent lack of storage space, the good news is that, in most cases, there is indeed enough storage capacity to handle current data loads. Turn to the Essential Business Tech department for some advice on how your company can make the most of its existing storage space.

If you are in the market for additional storage, consider Aberdeen (www.aberdeenninc.com), a leading provider of servers and storage solutions. The Aberdeen Petarack™ is pictured here.



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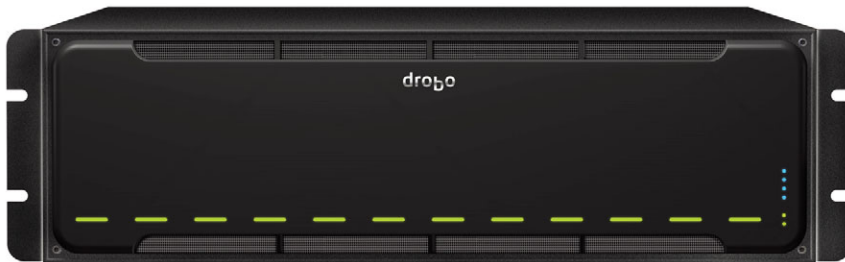
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DROBO SMB STORAGE TO USE OCZ ENTERPRISE SSDS

► OCZ Technology, a leading manufacturer of high-performance SSDs (solid-state drives), announced it is now working with Drobo, provider of data storage products for SMBs and individuals. Drobo's B1200i iSCSI SAN (storage-area network) device will integrate OCZ's Talos SAS SSD Series



Drobo's 12-bay B1200i networked storage device will use OCZ Technology's enterprise-class SSDs.

enterprise-class SSDs, thereby providing faster data access times, lower power consumption, and increased bandwidth. "Just like larger organizations, SMBs should be able to afford and enjoy the benefits of SSD technology and performance," said Drobo CEO Tom Buiocchi. Both OCZ and Drobo are San Jose, Calif.-based companies.

DELL TO BUY FIREWALL COMPANY SONICWALL

► Round Rock, Texas-based Dell has announced its intention to acquire SonicWALL, a San Jose, Calif.-based security company that specializes in NGFs (next-generation firewalls) and UTM (Unified Threat Management) firewalls. Terms of the deal were not disclosed, but sources for *The Wall Street Journal* value the deal at about \$1.2 billion.

QUANTUM SECURE WORKING WITH TSC

► Quantum Secure recently announced a partnership with the

TSC (Transportation Security Clearinghouse) to speed up the processes associated with issuing airport security badges. Based in San Jose, Calif., Quantum Secure is best-known for its SAFE suite of enterprise security identity management

software. The TSC originated as a partner to the federal government in 2002 as a response to the Sept. 11, 2001 attacks. "By automating all processes connected to identity vetting, credentialing, and access provisioning, airports can be more efficient than ever before while maintaining compliance with all TSA regulations surrounding airport worker identity verification," said Laurie Aaron, vice president of business development for Quantum Secure, in a statement.

AMD TO ACQUIRE SERVER COMPANY SEAMICRO

► Semiconductor designer and manufacturer AMD will acquire server company SeaMicro for approximately \$334 million, including \$281 million in cash. Based in Sunnyvale, Calif., SeaMicro is known for its high-efficiency, low-power microservers, which use both AMD and Intel processors. "By acquiring SeaMicro we are accelerating AMD's transformation into an agile, disruptive innovator capable of staking a data center leadership position," said Rory Read, president and CEO of AMD, in a statement. SeaMicro CEO Andrew Feldman will become GM for AMD's new Data Center Server Solutions business.

MICROSOFT RELEASES WINDOWS 8 CONSUMER PREVIEW

► Emphasizing optimization for tablets, mobile productivity with 4G cellular support, virtualization features, and security, Microsoft COO Kevin Turner unveiled the Windows 8 Consumer Preview at the CeBIT trade show in Hanover, Germany, in March. With Win8, Microsoft is shifting the organizational focus to an overhauled Start screen, downloadable apps, and a better-integrated (and updated) Internet Explorer. Businesses will be able to develop their own apps, control how employees use apps, and offer a broader range of secure mobility options. The Consumer Preview is available now, as are additional resources for IT. The full release of Win8 is not expected until later in the year.



SILVERBACK ACQUIRES CLOUD SOFTWARE COMPANIES

► Through its acquisition program, Austin, Texas,-based Silverback Enterprise Group has a stated goal of acquiring one or two \$5 million to \$15 million industry-leading enterprise software companies every year for the next five years. Holding true to its mission, Silverback recently announced the purchase of enterprise cloud software companies PowerSteering Software and Tenrox. The Cambridge, Mass.,-based PowerSteering Software makes portfolio management software, and the Glendale, Calif.,-based Tenrox makes business project planning software. "The combination of PowerSteering and Tenrox," said Jack McDonald, Silverback's founder, "creates the industry's undisputed leader in cloud-based project and

portfolio management software." The new company will take the PowerSteering name. McDonald will serve as its CEO.

QUEST SOFTWARE BECOMES PRIVATE COMPANY

► Quest Software, an Aliso Viejo, Calif.,-based developer of IT management software, announced it is working with Insight Venture Partners to buy back its public stock at \$23 per share and become a private company. Quest will then be valued at roughly \$2 billion. "Quest will continue in much the same way as before," wrote Chairman and CEO Vinny Smith in a letter to customers. "Although we will no longer be publicly traded, our goal remains the same—to be a market leader in enterprise systems management with a focus on continued innovation and superior service."

APPLE ACQUIRES APP SEARCH ENGINE DEVELOPER

► If you're an iOS user hunting for an app, you could spend a lot of time finding the right one if you don't have a specific app name in mind. Chomp has changed that for many users with its eponymous app, which uses a secret algorithm to generate on-target results more efficiently than the iTunes App Store. Look for changes in the App Store's search functionality, however, as Apple is reportedly in the process of buying Chomp for \$50 million.



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DUO SECURITY DOUBLES UP MOBILE DEVICE PROTECTION

► Google Ventures, True Ventures, and Resonant Venture Partners recently invested \$5 million in Duo Security (www.duosecurity.com), a mobile security firm that claims to make two-factor authentication easy by letting business users “use their mobile phones to secure their logins, protecting your company from account takeover and data theft.” Essentially, Duo Security involves employees using a mobile app to enter usernames and passwords followed by a second authentication method once the first authentication is verified. The company states it has invested “significant effort” in making the end user and integration experiences “painless,” claiming most deployments can be fully functional within a day with IT “receiving close to zero support calls from their users.”

TELLO GIVES BUSINESSES FEEDBACK

► In addition to announcing that it has raised \$2.7 million in Series A funding, Tello (www.tello.com), a SaaS (software as a service) and mobile app provider, recently announced it has released Tello for Business. The service aims to help businesses of all sizes “improve by enabling instant feedback via customers’ mobile devices.”



Tello for Business gives businesses a dashboard from which they can view live customer feedback data, including feedback specific to individual employees.

Essentially, iPhone, iPad, and Android mobile device users can use Tello’s consumer application to give feedback to businesses via email, text messages, and ratings. Users can also identify specific employees in the feedback. Tello for Business provides a dashboard with

customized views of feedback, business metrics, and employee ratings. Free and Premium \$99 versions of the business app are available.

CROWDSTRIKE ACQUIRES \$26 MILLION TO BATTLE BAD GUYS

► CrowdStrike (www.crowdstrike.com), a company led by George Kurtz, formerly CTO and EVP for McAfee and CEO of Foundstone, launched in stealth mode recently backed by \$26 million in Series A funding it secured. On his blog, Kurtz describes CrowdStrike as a security technology company that plans to help “enterprises and governments protect their most sensitive intellectual property and national security information.” Using Big Data technologies, Kurtz states, CrowdStrike is developing a new approach for combatting cyber-security attacks. Knowing the enemy, Kurtz states, is the first step toward “determining the priority of allocation of scarce resources to defend the key assets and tailoring your response to the TTPs (Tactics, Techniques and Procedures) of the adversary.” Key to this is “raising adversary’s costs to exceed the value of the data they may be trying to exfiltrate, and the only way to accomplish that is by forcing them to change the way they conduct the human-led parts of their intrusions, such as reconnaissance, lateral movement, identification of valuable assets, and exfiltration.”

EMPLOYINSIGHT GETS INSIDE EMPLOYEES’ HEADS

► EmployInsight (employinsight.com), a Web-based platform that helps companies “measure, manage, and use data about the psychological, emotional, and cognitive resources of its employees,” recently secured \$1 million in financing from Founder Collective, Launch Capital, and additional angel investors. The company simultaneously announced it released a beta of its first product, which several enterprises are using. EmployInsight states its platform can be applied to hiring, performance management, organizational development, and other areas with the goal of engaging employees in work they love. Employees, meanwhile, can use the platform to better understand their individual strengths to better apply their skills to work. The company states that its HireInsight product enables companies to “hire people who have the emotional and character strengths required for specific jobs and specific teams.” EmployInsight expects to release a second product this summer that will help managers and team leaders collect and view data concerning a team’s strengths and how the strengths define the team.

CONNECTED DEVICES & APPS TO IMPACT BUSINESSES

► Machina Research estimates the total number of connected devices will grow from more than 9 billion today to 24 billion by 2020, and that the types of connected devices, such as connected cars, will generate new revenue streams. For example, the company predicts that built-in connectivity will be a must-have

►► Top Connected Devices We May See In 2020 & Their Estimated Values

Connected Car	\$600 billion
Clinical Remote Monitoring	\$350 billion
Assisted Living	\$270 billion
Home & Building Security	\$250 billion
Pay-As-You-Drive Car Insurance	\$245 billion
New Business Models For Car Usage	\$225 billion
Smart Meters	\$105 billion
Traffic Management	\$100 billion
Electric Vehicle Charging	\$75 billion
Building Automation	\$40 billion

in vehicles, becoming an integral part of the driving experience. Other top connected applications in 2020 include pay-as-you-drive car insurance, which charges drivers according to driving behavior, and remote monitoring of patients with serious chronic illnesses in order to increase quality of life and decrease healthcare costs.

2011 RANKS HIGHEST FOR COMPROMISE OF PERSONAL INFORMATION

► Risk assessment company Risk Based Security states that the total number of personal information records exposed in 2011 topped 368 million, which is the highest annual lost-records total ever recorded. External sources to the organization dominated the data losses, accounting for 86.69% of all records lost in 2011, an increase from 60.1% during 2010. Computer-based intrusion was responsible for 33% of the 2011 breaches, totaling 305,809,012 records.

TOO MUCH SOCIAL MEDIA CAN DRIVE SHOPPERS AWAY

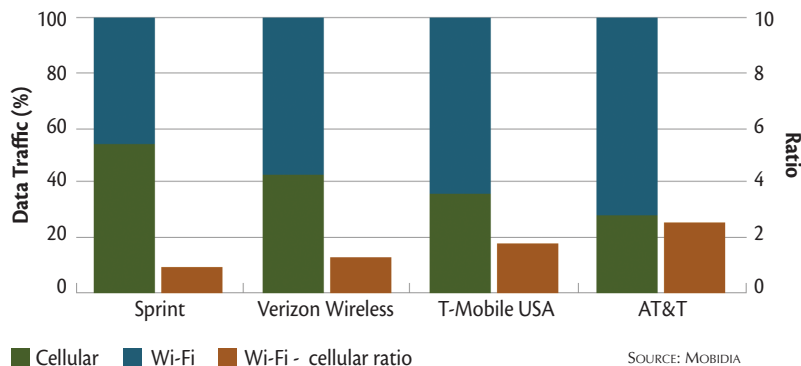
► Bizrate Insights reports that social media usage among online buyers has grown significantly since 2009. Some 63% of online buyers participate in social media sites, compared to 54% in 2009. Within the same time period, “liking” or “following” retailers via social media has more than tripled. However, a recent survey of online buyers found that 62% of buyers have stopped following or “liking” certain profiles in their social network. Common reasons cited for disconnecting from a product or brand were too many posts and irrelevant content.

SMBS UNAWARE OF MOBILE DEVICES CONNECTING TO THEIR NETWORK

► Mobilisafe has been conducting a study of SMBs to determine the level of visibility IT managers have into the mobile devices connecting to their network. The interim results indicate that most SMBs are highly mobile, with greater than 80% of employees using smartphones and tablets. Many employee-owned devices were connecting to SMB networks, but 39% of the authenticated devices were inactive on the network after 30 or more days. The research also found that SMB IT departments were challenged to meet corporate security standards on their mobile devices, for example, 56% of iOS devices were running outdated firmware.

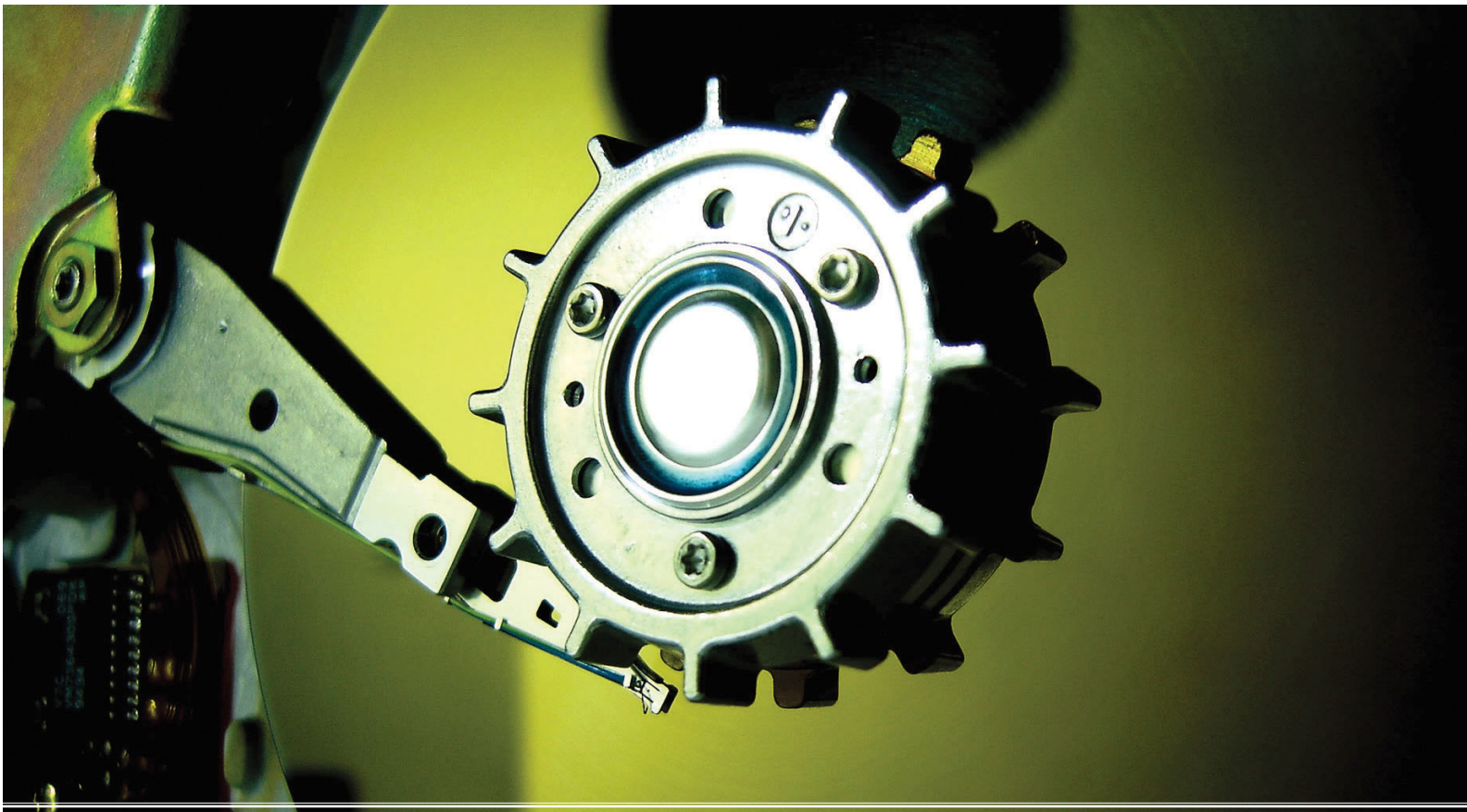
NEARLY HALF OF U.S. BUSINESSES TO OFFER MOBILE APPS

► A survey of CIOs by Robert Half Technology found that 27% of the CIO's companies currently offer a mobile application, and an additional 22% plan to develop a mobile app by the end of the year. The poll also asked what the CIOs considered the greatest challenge for IT teams developing a mobile app. The top three issues were collaborating across departments (29%), finding and hiring IT professionals with the necessary expertise (28%), and keeping the mobile application up-to-date (19%).



SMARTPHONE SUBSCRIBERS CHOOSE WI-FI FOR DATA

► Mobidia Technology and Informa Telecoms & Media found that global Wi-Fi data usage exceeds cellular data usage by a factor of 2-to-1. The sampled base used Wi-Fi for 70% of all smartphone traffic, and the results indicate that smartphone data use is much higher than reported by the industry. In the U.S., Wi-Fi vs. cellular use varied by carrier, with Sprint subscribers having the lowest percentage of Wi-Fi use and AT&T subscribers the highest.



Salvage Your Storage

Make The Most Of Your Existing Storage Systems

Solving the perplexing problem of dwindling storage space is quickly growing into a tricky science for businesses of all sizes. When a business encounters an apparent lack of storage space, the good news is that, in most cases, there is indeed enough storage capacity to handle current data loads. The not-so-good news is that it can be difficult to understand utilization rates and ultimately tune systems to handle the seemingly unwieldy data flow.

Key Points.....

Determining the actual utilization rates of storage systems can be difficult without good reporting systems that can cut through common inconsistencies.

Unstructured data, aging systems, and disparate protocols all contribute to poor utilization of existing storage systems.

Identifying the data types on storage systems and ensuring they reside in their proper locations will help in the process of reclaiming capacity.

Identifying and reclaiming allocated, but unused, storage is a critical step in making the most of existing storage architecture.

Further complicating matters is the typical wide variety of storage interfaces and related technologies used not only by different businesses, but even within the same environment. These various architectures usually have a common goal of providing manageable capacity for businesses of different sizes, but massive data loads can easily overwhelm even the best-designed systems, particularly if administrators aren't properly managing utilization and other factors.

CAPACITY CHAOS

Storage life is simple when a business first provisions a volume on a storage system, because utilization—or the amount of storage being consumed—is 0% at that point. According to Doug Babcock, storage architect at Evolving Solutions (www.evolvingstorage.com), that simplicity quickly dissipates with the subsequent steps of mapping and mounting the volume to a server and initializing a file system, which can prompt the storage system to report utilization anywhere from 5% to 100%. However, determining the actual accuracy of those figures can be a daunting exercise.

"Discrepancies in utilization metrics result from many factors, but file system metadata and storage subsystem tracking of those metadata writes are one of the most misunderstood points," Babcock says. "For example, one enterprise storage system provides thin-provisioned volumes to servers based on a 'chunk' size of 42MB. If the file system in use is UFS [Unix File System], the file system metadata is preformatted and written at 10MB intervals."

In turn, each storage system chunk—a predetermined collection of data—will be written to at least four times when the file system is initially created, but if the file system size equals the volume size, the storage system will report 100% utilization and consume 100% of the thin-provisioned capacity, Babcock explains. Yet the file system will report 0% utilization,

which ultimately makes the measurement of storage utilization (in this instance) an exercise in futility, he says.

"It's typical to find a huge amount of space that's being underutilized or even not utilized at all," adds Juan Orlandini, practice manager for Datalink (www.datalink.com). "Furthermore, on each of the servers, it might be necessary to understand how the storage is being utilized by the applications that run on them. For example, it's not uncommon to have storage presented by the array to the host. This host then carves this storage up into files that are used by a database. From the storage and host perspective, the storage is being utilized. However, when you look into the database, it's typical to find that the application is only using a fraction of the space that's been reserved for it."

Compounding the problem—and it's a big one, considering that Orlandini notes many businesses have net utilization rates well under 30%—is the existence of unstructured data, or data that doesn't reside inside of a database (such as information in a file server). Not only is much of this data rarely used, but much of it is replicated across identical, or mostly identical, files, he explains.

Other problems also contribute to inefficient use of existing storage, says Anton Kolomyeytsev, chief technology officer at StarWind Software (www.starwindsoftware.com). For example, aging storage hardware can accumulate over time, particularly in companies that transition from an SMB size to a larger enterprise environment. These can include relatively ancient architectures that are difficult to manage and maintain in efficiency terms. Another problem, he says, occurs when companies deploy both NAS and SAN protocols separately, rather than using products that allow multiprotocol access.

DEVIL IN THE DETAILS

Investigation is a key tool in making the most of existing storage. According to Kolomyeytsev, organizations need to

►► The SSD Solution

Lack of storage capacity doesn't just impact the ability to store data but also the performance of storage systems. When storage devices are over-utilized or otherwise poorly utilized, data access can slow to a crawl and quickly decrease business efficiency. However, the move to SSDs (solid-state drives) can help to solve this problem.

"The key is to focus not only on total capacity requirements, but to also identify any bottlenecks on the network or applications, says Daryl Lang, vice president of product management for OCZ Technology (www.ocztechnology.com). "A common example is the morning VDI [virtual desktop infrastructure] boot storm, where a large number of users are trying to log in at similar points in time. This can bring a network to a crawl based on lack of storage performance."

To avoid such situations, Lang recommends adding high-performance SSDs into server nodes and running caching software to let the SSDs relieve the bottleneck on the SAN. Through this method, data centers can retain the rest of their storage infrastructure but drastically improve efficiency.

study their hardware specifications to get an accurate glimpse of their current utilization and overall storage efficiency. For example, did you build a RAID set, and if so, how much raw disk space was wasted to build it? How much user space was lost to building a high-availability mirror configuration as a result of the RAID choice? Does your array have thin provisioning, and if so, is it actually enabled and properly used? Can your storage system perform data deduplication? Does your array have any cloud integration features and functions?

"The devil is in the details when it comes to storage technology, so you may easily find yourself in a situation with, let's say, 100TB of raw disk space that potentially allows you to store 25TB of your 'real data' and has no available storage optimization features," Kolomyeytsev says.

He also recommends looking at the types of data the organization is storing, because different data types should be stored in different ways. For instance, he says so-called big data is expected to be stored in a mostly unaltered fashion, as sequential write performance is critical with this data. On the other hand, primary virtual machine storage goes in the other direction, where random access dominates, thin provisioning is a necessity, and deduplication is highly useful.

In general, organizations that fail to implement various technologies such as thin provisioning and deduplication are doing themselves a storage disservice, especially if they're running out of room with their existing systems. In fact, Babcock recommends not only storage systems that support thin provisioning and deduplication (as well as compression and zero-space reclaim technology), but also file systems that support these features. Some organizations might discover that their storage systems already support these features,



Juan Orlandini
practice manager,
Datalink

"Obsolete systems are still a major factor in poorly utilized storage. However, the explosion of virtualized systems has exacerbated this problem by adding another layer of complexity."



Doug Babcock
storage architect,
Evolving Solutions

"It has to be a team effort. Your DBAs, server administrators, and storage administrators have to be communicating and working towards the common goal of saving money."



Anton Kolomyeytsev
chief technology officer,
StarWind Software

"If you have a large amount of users saving data to multiple storage platforms, the difficulty to analyze your environment and make effective decisions increases exponentially."



Daryl Lang
vice president of
product management,
OCZ Technology

"The solution today doesn't need to be to simply add more and more racks of servers or SANs. Data centers can boost existing infrastructure performance with SSDs."

but they're simply not enabled or used to their full extent.

"Once you've created a thin-provisioned infrastructure, consider over-subscribing your primary storage by allocating total volume sizes [also known as the soft limit] that exceed your physical usable capacity [the hard limit], while monitoring growth and rogue administrators very carefully," Babcock says.

IDENTIFY WASTE

One of the easiest ways to reclaim storage space is locating allocated, but unused, storage, according to Orlandini. In this scenario, a storage team provisions capacity to systems that were never brought online or were brought online but decommissioned without notifying the storage team. This scenario can also occur when systems were allocated capacity but it's never utilized by the department or a targeted employee.

"The next step is to find applications that requested and were assigned excessive amounts of storage. This is also a common scenario. Many application owners, DBAs, and system

administrators request more storage than they need in fear that acquiring more in the future will be difficult. Identifying this space is relatively simple," Orlandini says.

For corraling unstructured data growth, Orlandini recommends using a comprehensive archiving solution that can move old, stale, but required data from primary storage to an alternative, lower-cost location. Although the data moves to this other location, it will still appear to reside in its original location when end users access it. For virtualized environments, Orlandini recommends identifying virtual machines that have been decommissioned but have not been deleted from storage. And if you're not using virtualization, this could be the ideal time to get on board.

"Consider deploying a storage virtualization layer, which can aggregate every standalone storage pool you have in a single virtual pool," Kolomyeytsev advises. "It's much easier to manage all of your existing storage this way, and you should expect your chosen technology to add at least thin provisioning and some sort of caching to your entire storage infrastructure." ●

Encryption In The Enterprise

When It Helps, When It Doesn't

It is becoming almost routine to hear about high-profile data breaches these days, but the recent attack against the geopolitical analysis firm Stratfor seemed particularly messy.

A group of hackers from Anonymous successfully accessed thousands of Stratfor's records, which included customer credit card numbers, client lists, email addresses, and other sensitive data. The hackers then went one step further and shared data with Wikileaks, which subsequently published many of the records. Some of the emails appeared to reveal that the firm was offering à la carte intelligence services for private firms. However, most of the email messages that Wikileaks published had more to do with mundane exchanges between Stratfor employees, instead of serving as proof that the Texas-based firm was involved in a worldwide espionage cartel as some media outlets claimed.

Still, as far as Stratfor's security practices go, the main issue was that credit card and email backups were reportedly left on servers with unencrypted passwords, ready for the taking from any intruder. Some of the data probably should not have been stored on its servers at all and should have been deleted before the attack. Acknowledging that unencrypted storage of sensitive data, especially

customer credit card information, was the root cause of a tremendous security blunder, George Friedman, Stratfor's CEO and founder, was forced to publicly admit in a statement that the security leak "created hardship for customers and friends."

Among the many security lessons to draw from the attack is the importance of data encryption in the enterprises as a very powerful and effective data-protection tool. Without cryptography, an otherwise simple intrusion can blow up into a security nightmare. But at the same time, encryption is not a cure-all, and should always be used with the help of application firewalls, intrusion detection systems, and other protection.

WHAT ENCRYPTION IS

Encryption requires complex algorithms and processes in order to work, but the concept behind it is very simple. In a nutshell, encryption algorithms scramble data in such a way that it becomes unreadable until the information is decoded, or unencrypted, with a key.

By now, encryption has protected most users' data at some point, such as for online banking account access or email exchanges with a Web mail account through an SSL connection and a URL address beginning with "https." Because cryptographic algorithms

Key Points

Encryption uses complex algorithms to protect data, but once set up, it usually runs in the background unnoticed by end users.

Encryption makes data worthless to intruders and would-be data thieves, who lack the keys to decrypt that data.

Costly and often difficult to implement, enterprise-level encryption requires organizations to carefully assess what data they want to encrypt.

Enterprises can lose the data they hope to protect if encryption keys are lost, thus underscoring the importance of effective key management.



John Kindervag
principal analyst,
Forrester Research

"You have to find out what is toxic and then encrypt it. If it is toxic, then eventually someone is going to try to steal it."



Jamie Riden
independent
security analyst and
active member of the
UK HoneyNet Project

"It's [a matter of] diminishing returns. You encrypt the stuff that is easy to protect, like SSL network traffic. But when you get down to encrypting internal network links, there's already a much lower risk of that being intercepted, so the benefit is less at some point."

run in the background, the encryption process is usually so hidden that users are often unaware that they are using encryption at all.

On the enterprise scale, 33% of companies surveyed by Forrester Research (www.forrester.com) last year had installed email encryption. Network storage and database encryption adoption rates were 32% and 34%, respectively.

For endpoint encryption, enterprises are increasingly adopting cryptography to encrypt folders or entire devices on workstations, laptops, and mobile phones with either hardware or software solutions. Self-encrypting hard drives, for example, encrypt data so that it cannot be read until it is unlocked with a password when the system boots up. With software, encryption can protect files or entire drives. According to the Forrester survey, 38% of companies used full-disk encryption, while 34% encrypted files. Mobile devices make good candidates for encryption since the data on a lost or stolen device is unreadable without the key.

DESTROY & PROTECT

By devaluing data for intruders, there is thus little incentive to steal data after "killing it" with cryptography, John Kindervag, principal analyst for Forrester Research, says. "You have to find out what is toxic and then encrypt it," Kindervag says. "If it is toxic, then eventually someone is going to try to steal it."

Because encryption is so effective, Kindervag suggests that enterprises should eventually seek to encrypt all of their data one day to play it safe. "In the future, all data is going to be encrypted. That is just the default data state," he says. "Because if we don't do it that way, then we can't solve all of the attack problems. We have done it piece-meal until now, but in the future, it will be implemented in a more comprehensive way."

Some analysts, however, disagree with the concept of ubiquitous encryption. Instead, enterprises should look to limit encryption when possible and should carefully assess its feasibility for different workstations, laptops, mobile devices, database servers, and storage devices, says Ramon Krikken, a research director for Gartner (www.gartner.com). "The selective approach is helpful and can actually save money when a vendor insists that you need to encrypt all of your data," Krikken says. "This gets you out of that vicious situation where anytime you have sensitive data, you are just going to encrypt it."

Applying encryption everywhere will probably always be impractical, at least in the near term, says Jamie Riden, an independent security analyst and an active member of the UK HoneyNet Project (www.ukhoney.net.org). "It's [a matter of] diminishing returns. You encrypt the stuff that is easy to protect, like SSL network traffic," Riden says. "But when you get down to encrypting internal network links, there's already a much lower risk of that being intercepted, so the benefit is less at some point."

WHEN & WHERE

The complexity of cryptography, coupled with its high price tag, can dissuade enterprises from adopting it, especially SMBs with limited resources. An encryption license for a database application, for example, can cost \$10,000 for each CPU in a server, and, if not installed correctly, can still leave the server open to attacks. Pricing for endpoint and network connection encryption varies, but the solutions are usually far from cheap.

Given encryption's complexity, the implementation process is often best left to the expertise of third-party consultants and system integrators, even when there are experienced IT professionals on staff. "For the average smaller organization, the kind

of detail that encryption [implementation] involves is really hard to wade through," says Krikken. "It is not that the IT folks do not know what they are doing, it is that crypto is really hard-darn stuff. There are also so many moving parts involved to make sure that you can get to the keys and not lose any data."

The starting point when determining what data to encrypt involves pinpointing which data poses the greatest threat if compromised or stolen. Sensitive customer information and intellectual property are obvious candidates, for example.

Data that should be encrypted for compliance reasons also tops the list. For the storage of credit card data, PII (personally identifiable information), or other sensitive data, encryption is either mandatory or highly recommend to adhere to several compliance regulations. Encryption is also an effective way to comply with the HIPAA, HITECH, and PCI regulations.

Data under consideration for encryption can also be divided into whether it is data in motion or data at rest. "Data in motion and data sitting somewhere in a database have to be split into separate use cases," Krikken says. "You can't put the two together because you will lose site of what you are going to do. There isn't a good way to mesh the two."

FEAR OF LOST KEYS

The idea of locking down data with encryption and then losing it forever because the key does not work or was lost represents a major fear enterprises have about cryptography—and for good reason. If the keys are lost, then the data is lost.

"It is really easy to find yourself in the position where your sales person comes in one morning and says, 'I can't boot up my laptop because the password for Bitlocker or Truecrypt doesn't work anymore. There are \$50,000 contracts and if I don't close the deal, then we lose the deal.'"

Krikken says. "All of a sudden, you realize that you never made a key and never created a recovery option. How do you recover from something like that?"

Effective key management—which involves the distribution, storage, and termination processes for keys—is the best way to mitigate the risk of losing data. It is also the most important part of encryption implementation and management, Kindervag says.

Key management should also be centralized. "It becomes a much less challenging issue when key management is aggregated," Kindervag says.

CAVEATS

Encryption is great, "but it's not a panacea," Riden says. "If your site uses SSL encryption, but is vulnerable to security flaws, such as SQL injection, the attacker can still obtain the data when it is at rest and unencrypted."

Among the potential vulnerabilities: servers that are not updated with the latest security patches, an encrypted laptop that is compromised by a Trojan horse when the laptop is booted up and the data is unencrypted, or weak passwords. "Encryption solves a certain class of problems [associated with] keeping data confidential, and to some extent making sure it hasn't been tampered with," Riden says. "But it doesn't fix all your problems." ●



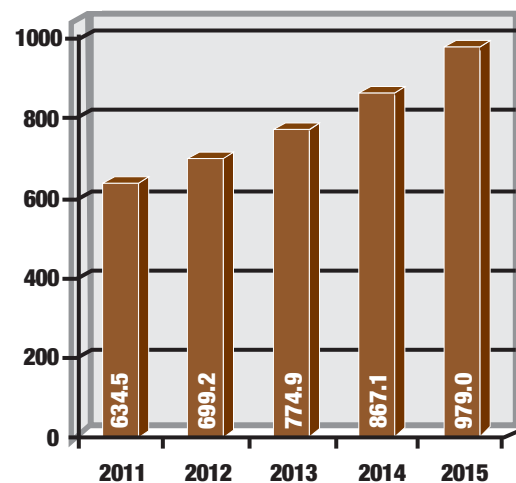
Ramon Krikken

research director,
Gartner

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➤➤ Endpoint Data Encryption Market

This chart, using data from IDC (www.idc.com), shows current and projected worldwide sales (in millions of dollars) of combined encryption types, including disk, file and folder, and portable storage encryption.





Social Media Meets The Corporate Landscape

Collaborative Software Offers New Approach To Internal Communications

Human beings are social animals. It should therefore come as no surprise that today's most prolifically visited Web sites all seem to have lucratively tapped into the human craving for social interaction.

The key to this unprecedented success lies in the ability of such sites to establish and reinforce social relationships amongst their users. Consequently, social networking sites have almost overnight changed the way hundreds of millions of people interact online with their friends, family, and even the public at large.

Most companies have recognized the importance of social media in the public sphere. Indeed, countless marketing and support teams are already active on Facebook, Twitter, LinkedIn, and

other social sites. Now, companies are beginning to appreciate the benefits of making social media part of the internal corporate fabric. SBS (Social Business Software), as we'll explain, provides organizations with a means to integrate social media into their communication and collaboration systems.

SOCIAL BUSINESS SOFTWARE

"SBS is an emerging category of technology that aims to bring the capabilities of consumer social media tools—such as Facebook, Twitter, Flickr, LinkedIn, WordPress, and

Tumblr—to the enterprise, for use by employees, behind the firewall," explains Joe Shepley, vice president and practice leader at Doculabs (www.doculabs.com). "The goal is to give employees the superior user experience and foster the same kind of dynamic collaboration and information sharing provided by these tools."

One of the goals behind SBS is to make the software intuitive for employees, many of whom are already familiar with social networking sites. Jeremiah Owyang, an industry analyst with Altimeter Group

(www.altimetergroup.com), views SBS as a de facto corporate publishing system featuring "... a set of applications that allows users to create, share, or consume content created by anyone, even if they don't have technical knowledge." Marc O'Brien, vice president and general manager of social business software at Acquia (www.acquia.com), concurs with the publishing comparison. "We've seen some companies replicate Facebook-

like features for the enterprise in order to foster collaboration and reduce costs," O'Brien says.

"The basis of these tools is rooted in the Web 2.0/social media world, but it has grown into much more from a business perspective," says Michael Fauscette, leader of IDC's (www.idc.com) software business solutions group. "The use of social tools and concepts reaches across the business and includes customer facing activities as well as employee and partner collaboration."

Fauscette cautions, however, that SBS does somewhat diverge from the consumer-based social media despite the many similarities that the two methodologies share. "Social business software differs from consumer social Web software for networking, communications, and media because it is built with business needs in mind," says Fauscette. "Consumer social tools do not meet the security, governance, and IP protection requirements of most businesses, so SBS was developed to fill the gap."

According to Shepley, SBS tools vary widely in how they function, but most of them provide some combination of allowing users to create an online profile (including pictures, interests, and expertise); connect with others to build



Joe Shepley

vice president and practice leader, Doculabs

"SBS has no value in and of itself—its value comes solely from its ability to help organizations achieve their business objectives."



Michael Fauscette

leader of software business solutions, IDC

"If a company doesn't learn how to build influencers in this new paradigm, they will lose to businesses that 'get it.'"



Jeremiah Owyang

industry analyst, Altimeter Group

"The term 'social business' will go away as these tools permeate an organization ... instead, we'll just focus on getting work done quickly."

BUYING INTO THE SBS APPROACH

According to O'Brien, business should take a long, hard look at SBS for a slew of compelling reasons including social marketing, customer support, social market research, open education, and partner collaboration. Shepley adds that the best reason for adopting the SBS paradigm is that it's good for business. Owyang says that Altimeter's analysis has determined that the current of-

fering of SBS solutions can be divided into a number of unique categories. "We see them grouped by social networking, listening and analytics tools, curation and aggregation tools, publishing tools, and social platforms."

In today's distributed workplace, staff is not always located within the same physical office. The interactive format of SBS helps connect team members with their colleagues and promotes active communities of practice for sharing key areas of institutional knowledge. Such sharing usually results in improved communications, faster problem resolution, increased visibility, and a greater leveraging of corporate expertise. The reduction in travel costs, as well as the memorializing of best practices in an interactive format, also benefits those organizations utilizing SBS. The bilateral communication capabilities of SBS also provide an outlet for the organization's management and workforce to easily communicate in an open fashion. Of course, such a relationship is most productive for organizations that emphasize employee autonomy and self-responsibility over the hierarchical command-and-control model of management.

"The social intranet helps employees to collaborate, identify ex-

networks; and share, consume, and comment/rate content (from brief status updates to longer documents and even photos or images). "It's important to note that SBS is generally considered to be distinct from the business use of social media (e.g., having a corporate Facebook page, publishing a business blog, or using LinkedIn to connect with clients)," says Shepley, who concedes that some SBS vendors have begun to bridge the divide by providing businesses with a single platform to handle all their social business activity, whether internal or external. Owyang likewise agrees that there is currently some confusion in the industry with regards to the terminology associated with SBS being applied in a consistent fashion. O'Brien, however, states that the important takeaway of SBS is that it can deliver value to organizations by leveraging the social paradigm in the first place. "The social communication from Facebook and others have become standard methods of interpersonal communications," says O'Brien. "Acquia's Drupal Commons, and SBS in general, are taking these very familiar methods of online communication and targeting business value opportunities."

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"The social intranet helps employees to collaborate, identify ex-

perts, and find information faster,” says O’Brien. “SBS also promotes open government by socializing public sector processes, addressing disclosure requirements, and presenting findings clearly.”

Managers also have much to gain from an SBS implementation, because it positions them to better identify activity hubs, leaders in the making, and de facto coalitions within their organizations. As a result, managers can learn more about the work habits and spheres of influence of their respective team members. Such insight provides a glimpse into aspirations and competencies.

SOME HURDLES TO OVERCOME

While they’re extending their brand presences on the ever-popular public social networking sites, some enterprises are having a difficult time getting employees to embrace the internal portion of their SBS networks.

Careful planning must be taken when making the decision to extend

social networking internally within an organization. The task of assessing needs, correctly implementing technologies, and establishing a sustainable SBS platform is a daunting project without a well-crafted roadmap. Few things make employees more cynical than a failed corporate initiative, and an SBS rollout that falls flat on its face with no one using it would be no exception.

After all, there is a natural tendency to keep all internal communications private; posting them on an internal wiki or blog may not seem like a natural action for some people. The idea of sharing years’ worth of experience in a place where the rest of their colleagues—and their managers—have access can be a scary proposition. Some people will want to hold their knowledge close, which is counterproductive to the SBS model. Likewise, some employees are also not interested in raising their visibility within the organization and are simply content keeping a low profile.

Fauscette contends that social business is as much about changing business culture as it is about technology. “Moving the business to an open, transparent, connected, and collaborative model has a number of measureable benefits across a wide set of activities,” says Fauscette. “For example, businesses that use internal social collaboration tools report 11 to 30% gains in employee productivity (in a recent IDC survey of 400 North American businesses).”

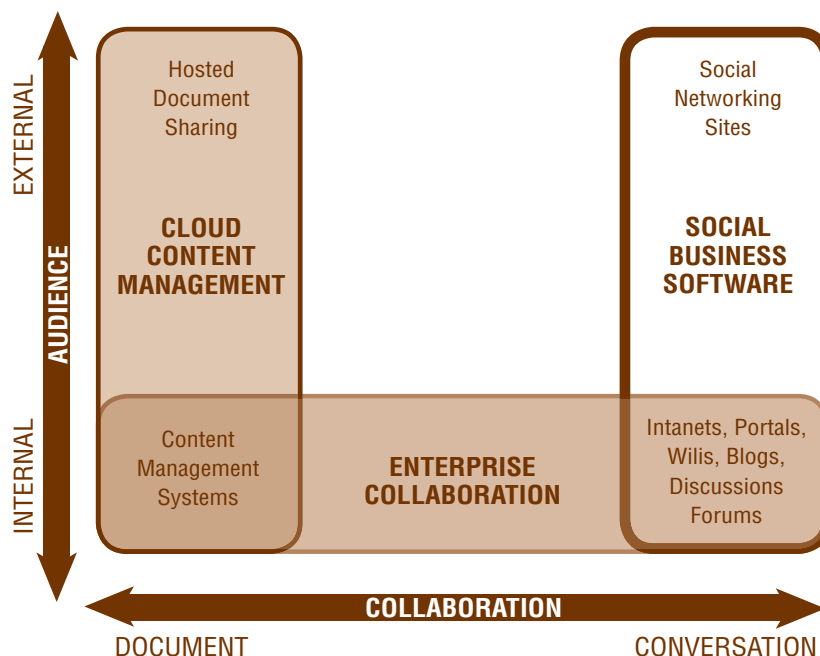
Fauscette also warns that organizations that shy away from SBS may unfortunately find themselves unable to retain existing workforce talent and recruit additional talent. “Internally, employees expect to be provided tools that are as easy to use and enabling as the tools they use in their personal lives,” says Fauscette.

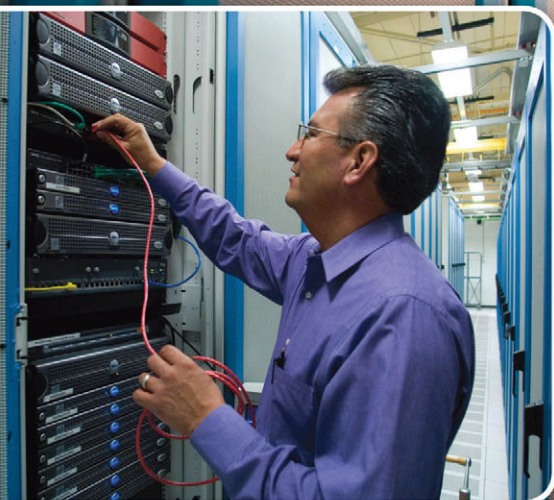
“By the end of 2012, a social business approach will no longer be a choice, it’ll be an expected part of doing business, both on the part of employees—who are tired of having better collaboration tools at home than at work—as well as customers—who will refuse to do business with companies who can’t meet them where they live online and in the ways they are used to interacting there,” adds Shepley.

According to Shepley, SBS is not a passing fad and instead represents a substantial evolution of how business will need to be conducting in the 21st century. Unlike the manufacturing, computing, and process engineering gains of the previous century that have all been business driven, SBS has largely been consumer-driven. “This is a new dynamic for businesses to adapt to,” says Shepley. “Those that have already done so (Dell, Starbucks, Kohls, JPMorgan Chase, etc.) are reaping significant rewards; those that wait too much longer to do so will find themselves rushing to play catch-up and having missed their chance to gain competitive advantage from the use of SBS.” ●

►► Audience vs Collaboration

The relation of social business software to other enterprise software categories.





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A Cloud You Can Call Your Own

The Transition From Public To Private

Simply defined, cloud computing is the provisioning of on-demand computing resources on a subscription basis from the provider's data center to its user base.

Cloud computing providers, such as Amazon and Google, typically deliver their services in a Web-based environment so users can use a browser to easily access the services. This open kind of cloud environment is more commonly known as a public cloud because anyone can subscribe to the service.

"At its most basic level, cloud computing is having information technology resources—servers, storage, and applications—moved outside of your business's walls," says Alex Rodriguez, vice president of systems engineering and product development at Expedient Communications (www.expedient.com), a managed data services provider with

data centers across the Northeast and Mid-Atlantic.

LIGHTS, GAS, WATER . . . & THE CLOUD

One benefit of the cloud is that it allows providers to offer services without forcing end users to know the messy details of the underlying computing infrastructure. Although a litany of data center technologies makes cloud computing possible, it is important to understand that the cloud—from the user's perspective—is actually a metered commodity akin to that of a utility company. "You may be using cloud computing without even realizing it," he adds.

As a result of its utility-like approach, cloud computing has a great deal to offer SMEs interested in realistic turnkey solutions. "The cloud lets you pick what resources you need to run your business without them being located inside the business," says Rodriguez.

THE CLOUD GOES PRIVATE

One of the latest additions to grace the sometimes nebulous world of cloud computing is the private cloud, which provides an opportunity to deliver the general benefits of cloud computing while mitigating the risks and challenges associated with the public cloud.

Unlike the open personality of the public cloud, private cloud computing provides scalable services exclusively for a single organization within a closed network. Whereas a

Key Points

The somewhat nebulous nature of cloud computing often leaves SMEs initially struggling to understand its benefits.

... The private cloud provides the same provisioning and subscription benefits as the public cloud without many of the perceived security concerns often associated with the public model.

... The private cloud is dedicated to a single entity; the SME can control manage, secure, and recover the cloud or turn management over to a third-party provider.

... When planning for a private cloud deployment, an organization must be mindful of network throughput, hardware availability, systems management capabilities, application readiness, and usage patterns.

public cloud operates beyond the control of its user base, the private cloud is under the control of the organization using it or a third-party provider the organization chooses. The SME or provider can then manage, secure, and, if necessary, recover the data stored in the private cloud. Private cloud services are gaining traction amongst those businesses wanting to be in command of their applications and related data while still taking advantage of the scalability and ease-of-deployment benefits offered by the overall cloud approach.

When compared to public clouds, their private brethren offer SMEs a greater level of security. Thanks to the inherent exclusivity of a private cloud, security is perceived as much more stringent and controllable. According to Rodriguez, this does not negate the need for due diligence when considering an externally hosted private cloud. "You're entrusting your data to an outside cloud provider, so you need to make sure that it is protected," says Rodriguez.

In addition to weighing a provider's aptitude for adequately securing the private cloud, SMEs need to also be mindful of other key attributes, including infrastructure flexibility, storage capacity, service levels, support capabilities and overall project leadership. All of these things are equally vital to the initial vendor evaluation process. Providers that offer a project road map, general guidance, and best practices can be particularly helpful to businesses that are entering the world of cloud computing



Alex Rodriguez

vice president, systems engineering and product development, Expedient Communications

"Private cloud computing is building out a service bureau – or IT 'power company' – for use by the rest of your organization, where you control the generation, distribution, and metering of resources."

for the very first time. In order to minimize costs, SMEs may want to focus on comparing vendors offering hybrid implementations that combine cloud-based solutions with existing on-premises infrastructure.

"Due to significant technical and business hurdles, many small-to-medium businesses look to cloud computing providers to provide a hosted private, or hybrid, cloud," says Rodriguez. "Cloud providers are already familiar with the technical and business challenges of creating clouds, and they can provide a private cloud as a service, negating the high startup costs and some of the

risks associated with building your own private cloud."

Regardless of where the cloud is ultimately hosted, Rodriguez contends that ample training and proper documentation are essential for a productive launch.

BUILDING YOUR OWN PRIVATE CLOUD

If your organization requires direct internal control over its entire infrastructure assets, a completely on-premises private cloud may be what you need. There are a number of things that SMEs should be cognizant of, though, when planning for such a deployment. Rodriguez says that an organization must be mindful of startup costs as well as network throughput, hardware availability, systems management capabilities, application readiness, and usage patterns.

"Private clouds aren't for the faint-hearted and involve significant complexity, cost, and technical know-how," says Rodriguez. "To build one yourself

can be a daunting task; it's much like building your own power company."

If you are looking at building a private cloud, you'll need to conduct an honest assessment of your company's current infrastructure. Ask yourself whether your business possesses the necessary computers, network hardware, and expertise to even entertain the idea of a private cloud. If the answer is no, then you may want to consider beefing up data center operations or taking the third-party hosting track.

Following the initial assessment, an organization needs to settle on a design that meets its reliability, security, scalability, and accessibility requirements. "This design will include servers, storage, network, and software," says Rodriguez.

It is vital, Rodriguez says, that the SME fully comprehend the design before proceeding because any mistakes during this phase can prove costly later in the process. The optimization of existing server capacity is central to the design phase. By pooling existing resources through virtualization technologies, SMEs are better positioned to deploy applications, reduce sprawl, and spread workloads. In addition, the standardization and automation of IT processes behave as force multipliers and maximize utilization of existing infrastructure and personnel resources.

"You also need to understand how your different departments will interact with the cloud in order to determine how to automate and orchestrate it," says Rodriguez.

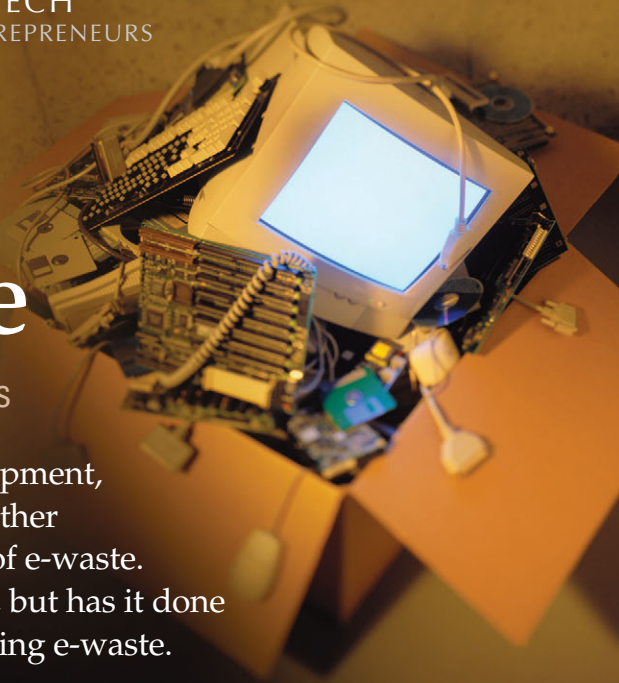
IT'S YOUR CALL

The cloud's inherent virtualized scalability provides enterprises with uncomplicated deployments and built-in redundancies without any of the start-up costs normally associated with solutions developed in-house. It is important to research all your options and determine whether the cloud will meet your company's needs on every level. ●

How To Handle Business E-waste

Guidance For Reusing & Recycling Obsolete Electronics

Computers, cell phones, fax machines, networking equipment, televisions, VCRs, DVD players, PDAs, monitors, and other electronics that have become obsolete are all examples of e-waste. Your business has likely dealt with its share of the stuff, but has it done so responsibly? The following offers guidance on handling e-waste.



WHY DO IT?

Some estimates suggest there are upward of 600 million obsolete computers in the United States alone, enough to span six acres and stretch a mile high. Other estimates state 80% of U.S. e-waste ends up in landfills, while globally 40 million tons winds up in dumps or is incinerated annually. Two particularly startling estimates state that only 10% of unwanted computers are properly recycled, and more than 70% of discarded electronics are shipped overseas to developing countries with few, if any, safety regulations. This includes e-waste that U.S. recyclers ship to countries where unprotected locals burn, tear apart, dump, and bury electronics. These processes expose workers, communities, wildlife, water resources, and crops to the hazardous materials the e-waste contains. (Many estimates, for example, proclaim one computer contains upward of four pounds of lead.)

HOW TO DO IT

Proper handling of e-waste begins with the purchase of electronics that have “green” (environmentally friendly) traits. One resource that assists in this effort is EPEAT (Electronic Product Environmental Assessment Tool; www.epeat.net), which maintains a registry of green electronics. After purchasing electronics, businesses can implement any number

of monitoring and management tools aimed at enabling more efficient energy use. The FEC (Federal Electronics Challenge; www.federalectronicschallenge.net) and Energy Star (www.energystar.gov) offer resources.

Once electronics become e-waste, the primary methods for responsibly handling the devices are to reuse or recycle them. Reuse can be as simple as donating old electronics to schools, churches, or other organizations. The EPA (tinyurl.com/6q5nksq) and NCER (National Center For Electronics Recycling; www.electronicrecycling.org) provide resources for finding local, manufacturer- and retailer-, and government-supported reuse and recycling programs. The EPA’s Plug-In To eCycling program, for example, helps develop reuse and recycle programs through national and local partners.

Where recycling is concerned, it’s important to understand local and state regulations. The EPA, NCER, and NERIC (National Electronics Recycling Infrastructure Clearinghouse; www.ecyclingresource.org) all offer information on the topic. According to NCER, 25 states currently have laws concerning e-waste.

Arguably, two of the most important recycling-relating issues for businesses include making certain that data is disposed of on old electronics before recycling and that decision makers

select a recycler that handles e-waste responsibly vs. shipping electronics to impoverished nations with suspect oversight in place. Morris Scott, CEO of DMD Systems Recovery (www.dmdsystems.com), a reprocessing company for enterprise IT equipment, advises seeking out recyclers certified under such standards as e-Stewards (e-stewards.org) and the R2 Standard (www.r2solutions.org).

“In addition to R2 or e-Stewards, there are a number of companies that are Microsoft Registered and Microsoft Authorized Refurbishers,” Scott says. “In order to become registered, or more stringent, these certified companies have demonstrated a commitment to handling e-waste in a responsible manner.” Further, he says, certified recyclers have made “a substantial commitment in resources, training, procedures, and processes in order to become certified. In the case of R2 certification, [a company] has also agreed to go through an audit to become certified.” Scott adds that “having processes in place for handling e-waste can be profitable” and allow businesses to “become more efficient and have less liability.”

To find a local recycler and learn more about donating, Eco Squid (www.ecosquid.com), Earth 911 (earth911.com), and TechSoup.org provide search engines and other information. ●

Warning



Low Disk Space!

You are running out of disk space on Local Disk (C:). To free space on this drive by deleting old or unnecessary files, click here...

Free up Disk Space in a Quick and Easy Way

This is so typical – you think you have more than enough free disk space only to discover the opposite. You can't sync your devices or upload photos from your digital camera because there just isn't enough space. When this happens, most people start deleting files and end up deleting something important. But there is a better solution – run Easy Duplicate Finder™ to remove duplicate files.

All computers have duplicate files. Think of how many times you might have saved the same file in two different folders, uploaded your photos twice, or edited a document and saved multiple versions. Easy Duplicate Finder™ is the tool that makes managing duplicate files really easy. It will intelligently detect useless duplicates by matching them by name, size, date and even content. The program will then display the results and let you delete duplicates in just one click.

Easy Duplicate Finder™ supports all types of files, including photos, music files, videos, documents, and even Outlook emails. With Easy Duplicate Finder™ your hard drive will never get cluttered by duplicates and you will always manage your files in an effective way.



Easy Duplicate Finder works with:



www.easyduplicatefinder.com/smartcomputing



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Email Best Practices

Quick Guide To Avoiding Email-Related Threats

Email is a business staple for companies of all sizes. It's also a source of security threats from nefarious hackers. What follows is a refresher on how to avoid email threats.

KNOW THY SENDER

Hackers have long targeted users with spam, or unsolicited email, to entice them into loading viruses or malware, providing personal information on Web forms, and more. Spammers obtain addresses, says Pierluigi Stella, CTO for Network Box USA (www.networkboxusa.com), through Internet harvesting, purchasing email lists, browsing Web sources (LinkedIn, Google, etc.), hacking, and directory harvest attacks. The latter entails obtaining a business's domain and bartering the business with messages to guess the username convention. "How many companies have email such as john@theirdomain.com?" Stella says. "That is so easy to spoof." The best weapon against spam is simply deleting messages from unfamiliar sources.

Another potential landmine is clicking the "unsubscribe" link in a spam message. Beyond verifying to the hacker that he has reached an active account, the link may direct the user to a URL used to download malware to the user's computer. Stella says, "If you think the email is spam and you hope that that link will actually work, think again." The link is only there, he says, to make it appear the message conforms to the CAN-SPAM Act and is "legitimate marketing."

DON'T GO PHISHING

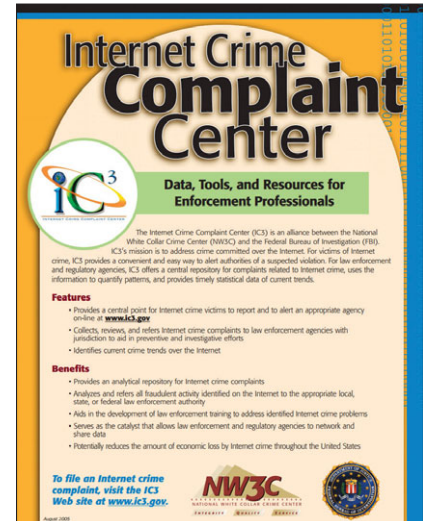
Phishing attempts are fraudulent schemes hackers use to trick users

into providing passwords, credit card numbers, Social Security numbers, and other information. Attempts often appear legitimate, such as a bank stating it has changed security procedures and needs you to update login information. Phishing attempts can direct users to Web sites that look genuine but contain malicious code or other methods for stealing data.

If you doubt a message's authenticity, contact the institution directly via phone or enter its URL yourself in a Web browser. Further, keep in mind that authentic messages are typically personalized to recipients, won't ask recipients to reply directly with personal information, and won't use "urgent" or "immediate" labels. Stella says, for example, if you receive a message indicating the FBI has declined your wire transfer to Latvia and "you have never sent a wire to Latvia," don't click the link. "Maybe your antivirus filter missed it, but why do you click? Just delete, delete, delete," he says.

BEWARE ALL ATTACHMENTS

Hackers have historically attempted to spread viruses, Trojans, and other malware using executable email attachments such as photos and documents. Take caution before opening any attachment and don't open those from senders you don't know. Instead, report the message to an administrator to verify it's legitimate. Also note that some attachments don't appear to contain a virus but can still be harmful. Generally, Stella says, hackers no longer include viruses in email messages to avoid being caught by antivirus programs. "[Emails] more typically contain something to entice



Users can report suspected spam and e-scams to the Internet Crime Complaint Center, an alliance between the National White Collar Crime Center and FBI that aims to address crime committed via the Internet.

the user to click a link, which in turn activates the download of the actual malware," he says.

STAY UP-TO-DATE

An effective way to avoid falling prey to email threats is keeping current on what hackers are doing. The FBI, for example, details recent scams on its New E-Scams & Warnings page (www.fbi.gov/scams-safety/e-scams). You can report potential e-scams to the Internet Crime Complaint Center (www.ic3.gov/complaint/default.aspx) and forward unsolicited messages to the Federal Trade Commission (spam@uce.gov).

Overall, Stella may offer the soundest advice: "Trust no one. Scan everything, and if your antivirus says something is wrong, don't click." ●



Since 1979, Sandhills Publishing has produced publications covering technology, beginning with the introduction of *Processor*. Over the years, the company has developed a complete line of computing publications, encompassing *Smart Computing*, *PC Today*, *Computer Power User*, and *First Glimpse*. Our plain-English approach has served audiences well for 30 years, ensuring that they receive accurate and unbiased technology information to meet their needs.





Improve Network Efficiency

These Tips Will Keep Your Business & Employees On Task

Regardless of how big or small your business is, its network is its lifeline to the world. For voice and video communication access, the ability to use shared files, or for accessing the Internet, a stable network is a necessity for any business.

Networks can be finicky, though. For a variety of reasons, network connectivity can be intermittent and can sometimes affect employee productivity. But there are ways to optimize and maintain your network's efficiency.

"Depending on the types of applications you're running, a misconfigured

network can have different effects on productivity," says Keith Morris, vice president of marketing at Talari Networks (www.talari.com) in San Jose, Calif. "It's one thing if you can't reach a website, but if you can't use your communication tools—Voice over IP or Skype—that can be a problem. Issues in your network can lead to voice

and video quality problems with those applications."

Morris explains that one key to optimizing the efficiency of a network is remembering that all networks have problems. He says it is important to minimize those problems, and one way is to decentralize the various tasks a network needs to perform by entrusting them to different service providers, thereby reducing the chance of a provider outage crippling your network.

"If your network connection is causing problems and you're regularly finding yourself offline for long periods, one thing to consider is getting some



network diversity," he says. For instance, you could go through one provider for DSL service and another provider for your cable service.

ANALYZE DATA

To identify what is causing problems and where your network is experiencing the most strain, you'll want to regularly analyze network usage. There are a variety of tools available that let you study traffic patterns, the infrastructure, and application-based performance metrics. Having this data at your disposal can help you diagnose problems and implement solutions quickly.

"There are analytic tools and readouts that can tell you what's being used and what's being downloaded," says Kevin Flynn, product marketing manager for Sunnyvale,

Calif.-based Fortinet (www.fortinet.com). "You can generate those reports yourself or get them from your service provider. If you see excessive bandwidth use or a similar problem from one machine, it could be a bot or some similar problem, or it could just be a worker downloading movies to his computer."

There are numerous reasons why an inefficient network can occur. Some are as basic as increased traffic, which naturally puts a strain on bandwidth capacity. You could also have a faulty network adapter or network cable on one or a number of PCs, which can lead to problems.

But often, even more than technical problems, poor management can lead to an inefficient network. "What businesses struggle with when it comes to their networks is the control issue," says Flynn. He explains that companies are realizing they need to control how they use the available bandwidth as social media continues to grow and employees bring their personal mobile devices with them to the office each day.

REDUCE NETWORK PROBLEMS

When troubleshooting a network problem, determine whether your company encounters the issue all the

time or occasionally. If the problem is consistent, then you may be experiencing an infrastructure problem; maybe it is as simple as not having enough bandwidth for the number of people on the network.

If you're seeing intermittent problems, though, your network's configuration may be the cause. Consider calling in a reputable third-party tech to conduct a one-time troubleshooting session.

Also worthwhile is establishing a shared drive that employees can use for transferring large files. Instead of sending a message containing a 5MB graphic file to 10 colleagues, you could save the graphics file to the shared network drive and notify those interested that the file is available.

And, although it might sound basic, a virus or malware can bog down a network in a hurry. Keep your antivirus and malware definitions up-to-date and make sure those programs are running on each machine.

Some network boxes will let you use them in a load-balanced format that's designed to provide high availability and reliability. This method lets you easily balance traffic across two wide-area network links so you can use all the bandwidth you've provisioned with one on standby.

"People should consider putting in quality of service that can differentiate and prioritize things like VoIP and reduce the probability of having a problem," says Morris.

Also, if your small business uses numerous applications that put a strain on traffic then it might be a good idea to get an outside vendor to manage it all. Installing a dedicated IP link for voice traffic, for instance, can relieve the strain on other resources.

"A managed services provider or a managed security provider should come into play in some cases," says Flynn. "There are pros and cons to using those services, just as there are pros and cons to trying to run everything yourself." ●



Keith Morris

VP of marketing, Talari Networks

"It's one thing if you can't reach a website, but if you can't use your communication tools—Voice over IP or Skype—that can be a problem."



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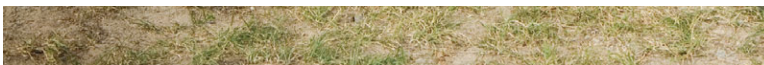


BeKnown helps you create a professional profile based on your personal Facebook profile.

Business Software

The Latest Releases & Updates

Mobility, social media, and integration are the trends in this month's edition of new and enhanced business software solutions. Software providers are making products accessible on more devices via the cloud, harnessing social media to sell to customers and monitor their engagement, and making their products work with other solutions for greater efficiency. Whether your business is large or small, there's something here that's certain to interest you.



To help you zero in on what's new, here's our latest roundup of business software releases and updates.

BEKNOWN FACEBOOK TIMELINE APPLICATION

Monster.com announced the launch of its BeKnown professional networking application that integrates with the new Facebook timeline. The application is designed to separate professional information from personal information on Facebook, allowing you to build a professional profile. You can invite colleagues to connect professionally, even if they are not your Facebook friends, and the app finds and recommends jobs for you based on your profile. Designed especially for recent high school or college graduates aged 18 to 29, BeKnown provides a method for employers to connect with the emerging workforce demographic.

FANMINDER 2.0

Fanminder (fanminder.com) is a Web-based tool that lets businesses create online promotions, such as coupons, daily deals, giveaways, and specials across Facebook, Twitter, and mobile phones. Do-it-yourself business owners can use Fanminder's control panel to easily design and publish offers, and then track redemptions in a dashboard. The latest version, Fanminder 2.0, features an Offers Gallery that provides you with different promotion types. The program also includes a new Offers Wizard that walks you through the process and provides a preview of the offer. Other new features include seasonal and holiday promotional ideas, themes for designing offers, and a larger text area to describe the offer.

FILETREK

FileTrek (filetrek.com) launched its new FileTrek cloud-based file sharing, tracking, and collaboration tool. You can share files across multiple devices, sync files, back up critical files in real-time, and generate audit trails and reports to determine who is viewing, downloading, or making changes to the file. For security, all files are encrypted and an internal storage option lets organizations use internal servers to host the files in a private system. Several plans are available, including a free individual personal file sharing and storage option. The solution can scale across thousands of desktops and mobile devices, maximizing overall productivity.

FISHBOWL PIPELINE CONTACT MANAGER

Fishbowl (www.fishbowlinventory.com) has developed a cloud-based CRM solution that integrates with its inventory management desktop application. The program will initially be available as a pre-release product so Fishbowl can gather feedback and add features. Current capabilities include lead tracking, task and opportunity tracking, and conversion tracking. Existing Fishbowl Inventory customers benefit from direct integration, letting them implement Pipeline immediately without third-party requirements.

MICROSOFT DYNAMICS CRM

Microsoft announced it will release the next service update for its Microsoft Dynamics CRM (crm.dynamics.com) program in Q2 2012. With this update, customers will be able to access Microsoft

Dynamics CRM via a new cloud-based, cross-platform, native mobile client for Windows Phone 7, iOS, Android, and BlackBerry devices. The service update also includes enhanced social functionality and new enterprise-class features, and it adds support for multiple Web browsers, including Chrome, Firefox, Internet Explorer, and Safari. More social media capabilities will be available with Activity Feeds, making it easier to monitor your customers' information.

ORACLE PEOPLESOFT FSCM 9.1 FEATURE PACK 2

To improve employee productivity, automate compliance and financial controls, and deliver greater industry depth, Oracle (www.oracle.com) recently announced the availability of the Oracle PeopleSoft FSCM (Financials and Supply Chain Management) 9.1 Feature Pack 2. The release offers new applications for financial governance and control, healthcare materials management, and enterprise service automation. New and enhanced features include integration of Oracle Enterprise Transaction Controls Governor with PeopleSoft Procure-to-Pay for transaction audits. Integration of PeopleSoft Global Payroll with PeopleSoft Cash Management for compliance with upcoming Euro Zone requirements is also included. For healthcare materials management, updates to PeopleSoft Mobile Inventory Management help streamline tracking of materials with the ability to capture digital signatures on deliveries, and the use of GLN (Global Location Number) is expanded to support current standards. Enterprise service automation

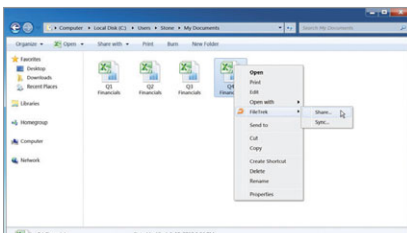
additions include a new Contracts Workbench to optimize contract revenue management and integration of PeopleSoft Program Management and Oracle's Primavera P6 Enterprise PPM 8.1 to streamline information flow between field project managers and financial operations staff.

REFLECTVIEW 6

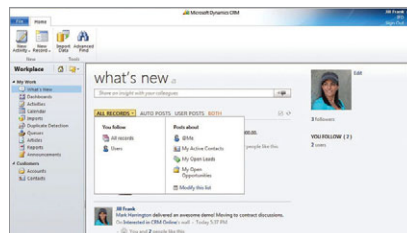
Reflect Systems (www.reflectsystems.com), a digital media solutions provider for retailers and businesses, has announced the release of version 6 of its ReflectView software suite. The software lets you manage in-store digital signage and displays, and the newest version offers enhancements in content and channel tagging, preview capabilities, distribution, and reporting. The new tagging system lets you apply descriptive tags and rules to individual files, playlists, and channels for more efficient content management. You can now preview content (videos and playlists) in the ReflectView Publisher and also through a link-sharing feature that is accessible from desktops, laptops, tablets, and even smartphones. Reporting is also improved with more data and metrics.

ZYCUS ISAVE FINANCIAL SAVINGS MANAGEMENT

Zycus (www.zycus.com), a provider of procurement and supply management solutions, has released iSave Financial Savings Management. The new product helps organizations measure, validate, and connect procurement cost savings to corporate financial metrics such as profit and loss, cash flow, cost of goods sold, and balance sheet. Its main purpose is to align procurement with business performance objectives. Customizable to meet the needs of individual companies, the iSave Financial Savings Management solution offers you the ability to characterize different types of procurement cost savings, track procurement savings through various lifecycle stages, and associate savings with specific strategies. ●



FileTrek lets you share files with colleagues. Any changes made to files are synced with versions tied to all members of the project.



New Activity Feeds in Microsoft Dynamics CRM 2011 allow for record-filtering customization.

Greenovations

Energy-Conscious Tech

The electronic devices that make our lives easier also produce some unwanted side-effects on the environment. Fortunately, many consumer electronics manufacturers and businesses are working to create products that keep us productive while reducing energy demands to lessen our impact on the environment. Here, we take a look at the newest environmentally friendly technology initiatives.



Genius's DX-ECO wireless mouse doesn't run off battery power, can be used on almost any surface, charges in three minutes, and can be charged up to 100,000 times.

GENIUS DX-ECO WIRELESS MOUSE

Genius's DX-ECO (www.geniusnetusa.com) may not seem unique at first glance, but if you dig deeper, you'll find that the mouse doesn't run on battery power. Instead, it features a rechargeable gold capacitor that you can charge using a USB cable. Genius reports that you can recharge the capacitor up to 100,000 times, and the DX-ECO is fully charged on about three minutes. In addition to the eco-friendly capacitor, the mouse also has an ergonomic design and features the BlueEye sensor technology, which lets you use it on almost any surface including glass, marble, carpet, and fabric.

ENERG2 ENGINEERED CARBON TECHNOLOGY

Efficient energy storage has been a problem with batteries for many years. But EnerG2 (www.energ2.com), an Oregon-based green technology company, hopes to change that with engineered carbon. Designed specifically for use with hybrid vehicle batteries, recharged via braking, and energy grids, EnerG2's engineered carbon is able to store energy more efficiently and effectively. EnerG2's technology can increase ultracapacitor storage by 25% or more and, according to the company, products using this new carbon-based technology should be arriving on the market as early as this year.

GREEN ROOF TECHNOLOGY PLANT & SOLAR POWER

In recent years, some energy-conscious consumers and businesses have turned to green to reduce heating and cooling costs or installed solar panels to produce energy. Green Roof Technology (www.greenrooftechnology.com) has found a way to combine the two technologies. The Sun-Root installation approach uses photovoltaic solar panels, which are prone to overheating in certain conditions, to produce energy for a building. Those solar panels are placed on top of a green roof, which not only insulates the building while maintaining a waterproof seal, but also helps cool the solar panels and maintain performance and efficiency. And in the case of rain, the Sun-Root system has a drainage system in place that waters the plants and cools the panels simultaneously.

HYDROVOLTS TURNING WASTEWATER INTO POWER

Wastewater is seen by many as just that: waste. But Hydrovolts (hydrovolts.com) peered into the murky depths and saw an opportunity to produce energy using a Canal or Waterfall turbine. During the product testing phase, the company practiced with a small turbine and was able to successfully power a Christmas tree. Now, Hydrovolts is looking to expand the technology and use the many gallons of water flowing through waste management facilities to produce more energy. Hydrovolts reports that the current setup in waste management facilities limits the amount of energy their turbines can produce to around 40 to 50 kilowatts. But if these facilities accept and adopt the turbines, they could change the way that waste water is managed.

LEMNIS LIGHTING LED LIGHTBULBS

Lemnis Lighting (www.lemnislighting.com) recently announced its new 200-lumen and 350-lumen LED light bulbs, which are available for \$4.95 and \$6.95, respectively. These bulbs are more viable for desk lamps, closets, or other small spaces and are not suitable for lighting large rooms or buildings. Still, the low-cost lights have maximum lifespans of 15,000 hours and are more energy-efficient than their incandescent counterparts.

MIT RESEARCHERS CREATE PLANT-BASED SOLAR CELL

In an effort to lower the costs related to solar cell manufacturing, MIT researchers aim to marry the technology of photovoltaic cells with the natural process of photosynthesis. Although scientists are in the early phases of their research, they hope to grow plants or grass onto a zinc oxide frame. It is hoped that the plants and grass

ENLIGHTED VIRTUO SERIES LIGHTING CONTROL SYSTEM

Energy efficiency and power consumption are two issues facing many companies around the world. One thing some businesses may not consider is how often the lights are on in the building and whether they are used as efficiently as possible. Enlighted's (www.enlightedinc.com) new Virtuo Series uses an adaptive sensor to adjust lighting depending on the situation. For example, one employee may be at



his desk for more than eight hours a day while his co-worker is at his desk for only half that time. Each light fixture can monitor the environment and uses the right amount of power based on the current needs of the employee. According to Enlighted, \$42 billion is wasted in the U.S. on "unnecessary energy," and the Virtuo Series can provide energy savings of 50 to 70%.

Enlighted's Virtuo Series lighting system determines how much light is needed in a particular space and regulates power consumption to help cut down on energy costs.

will absorb sunlight and convert it to energy that businesses and homeowners can use. If successful, this type of technology could be an inexpensive alternative to other solar-based energy sources and take advantage of the natural, built-in efficiency of photosynthesis.

SOLARRESERVE BUILDS WORLD'S TALLEST SOLAR TOWER

If you drive down the road near Tonopah, Nev., you may see a 540-foot tower along the horizon. This is SolarReserve's (www.solarreserve.com) solar power tower, which will soon be outfitted with 10,000 mirrors to produce solar power using molten salt storage. SolarReserve expects the tower to be up and running next year and is teaming up with NV Energy to distribute the created energy.

SONY CONCEPT SHOWS NEW WAY GET POWER

Many programs have been put in place to help solve the problem of inefficient power consumption, and those programs have created guidelines that they believe people should follow. But Sony (www.sony.net) thinks there may be a better way to improve efficiency by using pay-per-use power. The company's outlet prototype uses a FeliCa wireless transmitter that would let consumers pay with a simple card swipe. Then, the customer would have the option to determine how much energy needs to be used to power devices. Sony also envisions an app for mobile devices that will show the user what type of energy sources are available and how much power there is to use. This approach could help with the conservation of power inside and outside of the home while also encouraging the use of alternative energy sources. ●

Patents & Privacy

How Risky Are Mobile Apps?



a mobile app can be a worthwhile (and sometimes necessary) tool for businesses. The good news is that it's getting increasingly easy, affordable, and profitable to devise such apps. The bad news is that it's possible to run afoul of existing IP (intellectual property) patents or inadvertently misuse private customer data.

THE PATENT INFRINGEMENT PARTY

A July 2011 article in the British newspaper *The Guardian* spotlighted a growing problem: As patent "trolls" step up their attacks on developers, often seeking injunctions and damages over completely unintentional infringements, developers are opting to remove their wares from popular U.S.-based app stores.

In IP circles, "troll" is the colloquial term for a NPE (non-practicing entity), an individual or organization

that owns patents within a given field but does not use those patents in any practical, productive sense. Instead, a troll's patents serve merely as litigation weapons in fights that more businesses are trying to avoid. This practice has become so common that even in 2010, *New York Times* blogger Nick Bilton wrote of mobile technology, "It looks as if we're in the middle of a patent lawsuit Super Bowl party."

James E. Geringer, a partner with Portland, Ore.-based law firm Klarquist Sparkman, LLP (www.klarquist.com), points out, "The patent system is meant to promote progress, and to help bring new solutions to market. If there's a market in this country for an innovative product or service, whether it's a software app or anything else, it would be highly ironic if businesses' perceptions of our patent system deterred them from bringing innovation to our markets. It would be a case of the tail wagging the dog, particularly if the weight of suits by non-practicing entities [were

to] end up keeping practicing entities from taking the risk of being in the U.S. market at all."

Loss of revenue from side-stepping U.S. app stores is only one risk. For those who choose to roll the dice and stay on the market, a patent infringement lawsuit can bring unexpected costs and disruptions. As Geringer notes, businesses can be too cautious, but they can also be too aggressive. No one can afford to forsake business markets any more than they can afford to ignore software patents simply because the research is inconvenient or costly.

PRIVACY PITFALLS

Beyond patent infringement concerns, mobile app developers must also contend with privacy issues. Currently, there are almost no limits on what user data a mobile application can retain or share. Only in late February this year did California announce the nation's first requirement for mobile apps to post privacy policies.

Not surprisingly, both **Geringer** and **Srivastava** recommend seeking legal advice early in the mobile app planning process.

Applications may have perfectly legitimate and useful reasons for accessing users' contact lists or location information, but handling this data irresponsibly (such as through not encrypting user data when sending it over the air) can lead to severe backlash. Amrita Srivastava, principal attorney at Redmond, Wash.-based Auxilium Law (www.auxiliumlaw.com), notes that potential results include "consumer lawsuits for damages and violation of privacy right, loss of business when consumers/media find out, and investigations by government agencies such as FTC and state attorney general offices."

No one questions that there are considerable business benefits to be had from mobile apps by vendors and users alike. Unfortunately, according to Srivastava, not all developers take proper care in designing their software, and startups often fail to manage the privacy risks inherent in mobile apps from the software's outset. Problems merely compound as the development process gets further along.

"Managing these risks should be an integral part of product planning, marketing strategies, as well as corporate policies," she says. "Privacy issues generally arise when (1) they fail to follow their own privacy policy—for example, they say they don't share information with third parties even when they do; (2) their employees, affiliates, network, or system inadvertently disclose consumers' personally identifiable information,

exposing them to potential harm; and (3) they call, text, or send messages or advertisements to consumers without their consent."

DUE DILIGENCE

Not surprisingly, both Geringer and Srivastava recommend seeking legal advice early in the mobile app planning process. A little investment can clearly yield a lot of dividends.

Beyond counsel, the situation for mobile app developers is not as bleak as it might at first seem. Geringer states that the risks of an injunction if sued by an NPE—which would necessitate a halt to associated app sales or recoding around the offending patent—are now very low. This is in part thanks to a shift in patent law arising from the 2006 case of *eBay Inc. v. MercExchange, LLC*, wherein the latter claimed to own the patent covering eBay's "But It Now" function. The case ultimately led to the elimination of automatic injunctions being issued following the discovery of patent infringement.

"Patents are analyzed like other injunctions in other areas of the law," says Geringer. "It's a balancing of factors. If the plaintiff is not practicing the patent, or competing with the adjudicated infringer, the plaintiff can have a

hard time showing that it really needs an injunction. Instead, a Court might order the adjudicated infringer to pay more money. That's not welcome, but it's less disruptive than an injunction, which can really throw a wrench in a company's gears."

The rise of the Internet has made selling mobile apps to very distant customers instantaneous and easy, but that also means that a developer in Maine can be sued for patent infringement by someone in California over literally \$5 in sales. Fortunately, the courts are not devoid of reason or mercy, and fears of a judicial system being out of touch with reality are often unfounded.

According to Geringer, judges are very unlikely to force a developer to argue a case over \$5 in a courtroom 3,000 miles from home. Courts are sensitive to litigation costs, company sizes, distances, and so on. Additionally, judges are more likely to show lenience to companies that can demonstrate their respect for IP and prove that they attempted to perform their due diligence in the app development process.

Similarly, Srivastava advocates for developers to document their actual privacy practices. That is, developers should determine the different points in each app's functionality where consumer privacy could potentially be compromised (e.g., when data is in flight to server-based storage, during employee interaction, and when sharing data with another app), detail these in writing, and describe how security measures were devised and implemented to address those risks.

"Make sure that your privacy policy reflects those practices at all times and revise the policy if necessary," says Srivastava. "Comply with the privacy protection standards in the industry, and routinely and frequently monitor your data security systems. If you do find yourself under legal scrutiny, don't do anything until you talk to a lawyer who is an expert in the field—and hopefully you hire one soon enough." ●



James E. Geringer
partner,
Klarquist Sparkman, LLP

"The patent system is meant to promote progress, and to help bring new solutions to market."



Amrita Srivastava
principal attorney,
Auxilium Law

"Comply with the privacy protection standards in the industry, and routinely and frequently monitor your data security systems."

SHOULD YOU HAVE Mobile Web Designers?

Mobile Is Somewhat Of A
Different Ball Game



Forrester Research (www.forrester.com) predicts that 1 billion consumers worldwide will own smartphones by 2016. Of these, 350 million will be employees using their devices in a work-oriented capacity. It isn't surprising, then, that Forrester expects business spending on mobility to double by 2015.

Naturally, acknowledging the corresponding rise in mobile Web usage, many companies want to take their existing IT resources in conventional Web design and throw them at mobile Web development. It's all the same Web, right?

Of course, nothing is that simple. Few public-facing businesses in 2012 would argue against the need for a mobile Web site, but the considerations and skill sets involved can be remarkably divergent.

SIMILAR, BUT . . .

"The Web on mobile devices uses a different set of tools from a PC browser approach," says Roger Kay, president of Endpoint Technologies Associates (www.ndpta.com). "The underlying operating systems are different, so the target environments must be understood."

The most basic distinction is between Web-centric code and native (on-device) application code. Obviously, native code written under iOS's Cocoa framework in Objective-C isn't going to run on Android or BlackBerry, so developers need to work at porting their native apps between the various platforms. Some people assume that simply coding for a mobile website alleviates the need to worry about platforms, but this isn't true. The site still needs to run properly on each of the major platforms as well as (at a minimum) those platforms' default browsers.

Cross-browser site compatibility is no easy task, even in the desktop world. However, learning what's needed to create compatible sites can be done fairly easily by development teams already versed in JavaScript for desktop browsing.

"If companies have folks who already have good JavaScript skills, the adaptation process can be fairly quick," says Jeffrey Hammond, principal analyst at Forrester. "There are some fairly good JavaScript frameworks out there that do a great job of rendering apps on mobile platforms. What does take more time is understanding how a four-inch

screen is different than a 10-inch or a 15-inch screen."

To begin with, a normal Web page covers a lot of space, allowing for plenty of room for information and links. But any tablet user knows that link-heavy pages tapped by imprecise human fingers lead to accidental link-tapping and therefore time wasted in extra navigation. Thus designers must reimagine the entire page paradigm for mobile environments, and some designers may need additional training in order to "think small."

"Beyond layout," says Kay, "the designer has to presume that the user has no access to other windows, which, while not strictly true in all cases, is likely to hold in most. Therefore, there's little ability to refer to other pages or exchange data between them the way one might on a PC. The Web app must be more self-contained, supplying all the information that the user might want to work with right there inside the app."

Not every business needs to worry about in-depth mobile Web training. In cases where native apps make the most sense—anything from strategy games to business productivity apps—

the company may only want to deal with supporting one or two platforms. The deciding factor is where the user's data needs to reside, which is often dictated by how often and at what speeds that data needs to be accessible. But in situations where user data is kept off-device, such as online banking, JavaScript, HTML5, and CSS combined can deliver most of the necessary ingredients for a professional mobile site. Better yet, these technologies cost fairly little to develop and maintain. Additionally, it is possible to have mobile sites with rich GUIs that feel to users like native applications.

IN-HOUSE OR OUTSOURCE?

According to Forrester's Hammond, mobile Web consumption is massive right now, and companies can expect to pay top dollar for third-party development services, at least until more companies become proficient at handling their own needs in-house. There is always the option of going offshore for programming, but this introduces its own complexities, and businesses are likely to find that even offshore mobile development costs more than other types of programming. This is a large part of why Hammond advises enterprises to develop their own mobile capabilities and capacity.

"You have to update applications or sites on a regular basis," he notes. "Because the operating systems update at least twice a year per platform, you're going to be doing more maintenance. If nothing else, you're going to be testing to make sure that when Apple updates its OS, it doesn't break your app. You want to support four operating systems that are updating twice a year? Well, that's eight releases of your app or site to support each year, and if you're doing that externally, you're going to be paying a lot."

Off-the-shelf options are also available. Clearly, this removes a fair bit of the development and support burden.



Jeffrey Hammond

principal analyst,
Forrester Research

"You want to support four operating systems that are updating twice a year? Well, that's eight releases of your app or site to support each year, and if you're doing that externally, you're going to be paying a lot."



Roger Kay

president,
Endpoint Technologies
Associates

"The Web on mobile devices uses a different set of tools from a PC browser approach. The underlying operating systems are different, so the target environments must be understood."

After all, why reinvent Gmail if that's all that the company needs? In many cases, particularly for internal use, off-the-shelf is fine. But if the business activity addressed by the mobile app or site is unique, and that uniqueness needs to be conveyed through branding, custom development becomes necessary.

"You need to go custom when the expense of buying off-the-shelf is higher

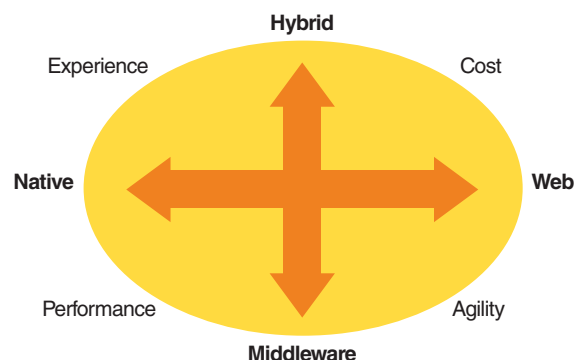
than the expense of developing and maintaining your own," adds Hammond. "You should also do it when you need to support changing processes or information more quickly than what you can get from third-party vendors. For tasks that are fairly horizontal, like collaboration, why would you write your own custom app? But for things that are unique to your businesses, there are reasons to want your own custom-developed app there."

COMPROMISE SOLUTION

If resources are limited, but what your business truly needs is the performance or other attributes of a native app (which might require outsourcing), you may want to take the middle path with "hybrid" apps. Hybrids are downloadable, like native apps, but they run at least some of their UI through browser elements. The advantage of a hybrid is that it brings many of a native app's benefits but remains more agnostic for spanning across multiple mobile platforms, and with fewer development headaches. Facebook's mobile app is a common example of the hybrid approach. The heavier reliance on HTML and JavaScript tools may make hybrid apps a more viable option for companies trying to seize their own mobile reins. ●

►► Four Mobile Application Development Choices

According to Forrester Research, there are essentially four approaches to mobile application development. What an organization chooses depends on its needs.



SOURCE: FORRESTER RESEARCH

Understanding RUGGED DEVICES

How To Decipher The Specs

Dropping a laptop or tablet on a hard floor or in a body of water is usually something to avoid.

But some enterprise users need rugged devices that can withstand such abuse and other harsh treatment in order to do their jobs.

While expensive, rugged devices can pay for themselves thanks to their long lifecycles, even while undergoing harsh use that would quickly destroy a standard unit. A forklift operator who needs to upload inventory data throughout the day

in a warehouse, for example, might require a tablet that can withstand the shock when it is dropped on a cement floor.

An indication of whether or not a device can withstand harsh physical treatment is the IP (Ingress Protection) Rating, published by the IEC (International Electrotechnical Commission; www.iec.ch), and the United States Military Standard that

vendors usually list with their rugged device product specifications. While the product ratings are not independently tested, think of them as detailed manufacturing claims about how well certain devices might be able to hold up in tough environmental conditions. In this way, the ratings offer crucial information during the buying process.

"Companies need [IP and military spec] ratings because they definitely help with their buying decisions," says Christian Kane, an analyst for Forrester Research (www.forrester.com). "[The specs] are obviously important because they are often going to spend a large amount of money on not only a single device, but on a fleet of rugged devices for a segment of their workforce."

But in order to interpret the ratings, it is necessary to understand what they mean. Deciphering what "IP45" or "MIL-STD-810C method

►► Selection Criteria

These are the top five mobile device selection criteria among enterprises, in order of importance, as reported by VDC Research (www.vdcresearch.com):

- Battery life
- Broadband wireless functionality
- Price
- Total cost of ownership
- Device weight and ergonomics

514.2" indicates in a product specification document, for example, can seem daunting to those unfamiliar with the nomenclature. However, the ratings are relatively straightforward to interpret after you know what they represent.

WHAT THE RATINGS MEAN

For IP ratings, vendors typically list two numbers, which indicate dust and water. A rugged laptop that can withstand continuous heavy layers of dust and that can withstand heavy

contact with water, for example, might have an IP rating of IP66.

The first number, which represents dust protection, ranges from zero to six. A zero rating means that the device is unprotected against any kind of particle contact. A rating of six means that the device is protected against the ingress of all particles, including dust.

The second IP number, for water protection, ranges from zero to eight. This number identifies how well a device can withstand water contact. A zero rating means that the device is unprotected against any kind of water contact while a rating of seven indicates that the device can continue to function when submerged underneath more than a meter of water.

Compared to IP ratings, the U.S. military rating system includes a wider range of environmental-resistance specifications. A vendor may list more than a dozen military spec testing methods and standards for an individual product, which might include resistance to vibration, impact, humidity, shock, temperature, and other conditions.

Military specs also include detailed descriptions about how tests are carried out. Testing controls, methodologies, and units of measurement are detailed in very precise terms. IP ratings, on the other hand, indicate the different environmental conditions that a device can withstand relating to dust and water but do not offer information about specific testing procedures.

It is sometimes unnecessary to look up the testing specifics for the military spec ratings in the MIL-STD-810C document because vendors often list and describe the tests used to obtain the measurements in their product spec sheet. But while the vendor descriptions can serve as a good summary of the different tests and overall ratings,

the MIL-STD-810 military spec documents (see bit.ly/A1kN8f) offer a more comprehensive overview.

RATINGS AS A REFERENCE POINT

While the IP and military specs serve as seemingly objective standards, vendors still have some leeway in how they rate their products. A vendor might design a device that it says meets certain IP and military standards, for example, without actually testing it. Despite the U.S. military's attention to detail in its MIL-STD-810C document, it is still nearly impossible to duplicate the exact testing procedures that the military uses, which can lead to an inflated rating.

Manufacturers also are not legally obligated to have their rating tests

verified by third parties. IP and military spec ratings that vendors communicate thus serve more as good reference points for specifications that reflect manufacturers' claims than they do as guarantees of quality.

In many ways, military and IP spec ratings should serve as a starting point during the rugged device selection process. Enterprises need to first carefully gauge the features they need in a rugged device, such as the ability to withstand shock, vibration, or extreme temperatures. Once a group of devices has been shortlisted based on how their specs offer a good fit on paper, an enterprise needs to perform its own tests in-house to see if a product lives up to the manufacturer's rating claims. It's also important to test whether a particular device can integrate with the corporate network and otherwise meet the company's and users' needs.

THE PRICE TO PAY

Sometimes enterprises may be impressed by how well a certain device meets a vendor's IP and military standard product claims during its in-house tests, but are less impressed with the price. They may be tempted to save costs by buying a cheaper laptop or tablet knowing that users can damage three or four of the devices for the price that it would cost to replace a single rugged unit. However, price considerations are not only measured in replacement costs.

"People often wonder if they can get away with using a [cheaper, non-rugged device]. But if a workflow gets disrupted because a device fails, you end up spending a lot more than what it costs to replace the device," says David Krebs, senior vice president for the mobile and wireless practice at VDC Research. (www.vdcresearch.com). "You spend a lot more than just replacing the device, due to lost operational costs, lost revenue opportunities, and customer service issues." ●



Christian Kane

analyst,
Forrester Research

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Mobile Workers & ONLINE SERVICES

Secure Them Or Face the Consequences

With worldwide spending on SaaS (software as a service) solutions rising 20% in 2011 (from \$10 billion to \$12 billion, per research firm Gartner) and predictions for the next decade going through the stratosphere, there's no doubt that cloud-based software has gone mainstream. However, security continues to be a concern, especially for mobile workers.

WORKING IN THE CLOUD

SaaS products and Web services offer a unique challenge for companies, says Patrick Bedwell, vice president of marketing for Fortinet (www.fortinet.com). "You do not know where the data is residing," he says. "It could be around the corner, or around the world."

This also means that more corporate information, including confidential client data, is traveling back and forth over the Internet. In many instances, activities take place independent of the corporate IT infrastructure, with no opportunity to apply security policies.

Of course, any SaaS or Web service worth using allows some control of corporate data at the provider level. More robust solutions allow a firm to establish user roles, and then personalize access restrictions to meet its needs.

At the minimum, SaaS providers and Web services should allow companies to decide how to share files, for example, making them public, available to anyone with the link, or private to only certain individuals. Usually, a company can also determine whether access is read only or editing is allowed.

REMOTE DATA ACCESS

Remote access of SaaS and Web services—and device authentication in particular—can become an issue for companies. "Users may be accessing the same content from different devices," says Bedwell. "Because people are logging on with so many devices, [the authentication system] cannot say, 'this is Rick's device.'" Those that do authenticate devices often require only that the user respond to an email message from the new device, a mechanism that is not difficult for a cybercriminal to thwart.

There is also currently no perfect safeguard available. "There is no one single solution for security, especially using remote data or resources," says Jim McGregor, chief technology strategist, In-Stat (www.instat.com). "Furthermore, there is no industry-wide effort to resolve the issue of security. So, IT managers have to continue creating solutions from all the alternatives available."

Because of the inflexibility of trying to authenticate individual devices, many SaaS and Web service providers rely primarily on identity-based authentication as their main access mechanism.

This can sometimes be frustrating for employees. Providers may have varying standards for passwords and usernames, so a firm's personnel frequently end up with dozens of log-ins for the various SaaS and Web services their firm uses.

This is difficult to manage in-house, but when workers travel, the situation is compounded. The result, Bedwell says, has been pushback from corporate

IT departments regarding adoption of SaaS and Web services.

IDENTITY MANAGEMENT

The only clear way to approach credentialing for firms, says Patrick Harding, chief technology officer of cloud identity at Ping Identity (www.pingidentity.com), is to become engaged in the authentication of users directly. "A worker on a mobile device, authenticating directly to [one or more] SaaS applications in the cloud, is a closed loop that keeps companies in the dark and without power," says Harding.

Our experts identified four scenarios for sign-on based authentication of SaaS and Web service users, each of which has benefits and drawbacks.

Password masking: A thumb drive or utility stores and supplies passwords on behalf of a user in order for him to access an application. "These tools remember passwords for you, but the remembered credentials can still be stolen or intercepted, and users may still reuse passwords at multiple sites, increasing risk for the corporation," says Harding. "These solutions aim for an improvement in convenience but do not address security or corporate visibility and control."

LDAP (Lightweight Direct Access Protocol) authentication: With this server-based approach, users supply a username and password for every application, but the credential is validated against a single credential stored by the system. This method is common within internal networks but is more difficult to manage when the corporate firewall

must negotiate externally based calls for LDAP authentication.

On device agents with VPN (virtual private network): This solution, which can act in tandem with LDAP and other in-house credentialing solutions, uses an on-device agent that directs traffic through a secure VPN tunnel to the company network. There, access and traffic can be managed by corporate policy, ensuring users access only those SaaS applications and Web services for which the company authorizes. These types of solutions can be completely transparent between the user, the company, the SaaS provider, and back again," Bedwell says, when the company has "a screaming-fast firewall."

Federated identity: This option lets users share identities securely across disparate networks and applications. It's the "glue" that for the secure, corporate-integrated SSO (single-sign on, where users need only one username and password) solutions that Ping Identity and some other third-party providers use.

PLAYING IT SAFE

There are so many options available that Harding says companies should evaluate any solution purporting to secure mobile workers for SaaS and Web services. "There are standard protocols in use today that allow a SaaS application to send a user back to the corporate realm to authenticate," says Harding. "When the SaaS application only trusts users who have 'called home' to authenticate, companies become a participant in the security regime of their cloud partners."

This solution is a win-win for everyone, says Harding. "SaaS applications benefit by offloading the burden of password resets and the risk of having credentials stolen and used to harm

customers," says Harding. "Companies benefit by keeping user credentials close to home, where they can be managed, monitored, and secured."

These types of solutions incorporate authentication elements, such as short-lived or one-time tokens, that are of no value if they are stolen. Their use makes it easier to deactivate an employee from access authorization. "The small attack surface and the immediate security benefit are two of the strongest selling points" of token based authentication, Harding says.

These corporate-facing measures, whether integrated into an SSO framework or tied to an on-device access management agent, result in a secure remote access solution.

IN-HOUSE OR OUTSOURCE?

If the thought of configuring and managing, in-house, a corporate-integrated solution such as we have discussed sends you reeling, there are other options. For SMBs that do not have large, sophisticated IT departments, outsourcing cloud-based identity management to a third-party provider can be an easy and cost effective approach.

Outsourcing has the added benefit of giving you another pair of eyes on the SaaS and Web service providers, as well. "All the service providers say, 'yes we have security, yes, we have audits,' but it's not easy for smaller firms to audit each provider individually," says Bedwell.

Firms that don't plan to use multiple SaaS applications or Web services—and are confident their employees won't, as well, may even find that their SaaS provider offer built-in, secure (token based, time limited, SSO, etc.) authentication capabilities. Some of the big ones do.

REALITY CHECK

If you're currently letting mobile users run SaaS applications and Web services independently—or you're instructing workers not to use them at all—you're not alone. A 2011 survey by research firm Vanson Bourne found that 73% of IT departments are not currently supporting SaaS (and social media) applications due to security, licensing, and other concerns.

However, this survey and others have also concluded that this stricture is encouraging users—especially mobile workers and even some C-level executives and IT personnel—to forge ahead with mobility and SaaS solutions outside the corporate IT framework.

The message of these findings is clear—SaaS and other cloud-based services are being adopted by corporate users, with or without the involvement of IT. Companies that avoid addressing SaaS and Web services, or do so without a clearly articulated and executed corporate policy, are putting their company, clients, and intellectual property at risk. ●



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Mobile MALWARE

A Status Report

For years, security providers have been warning us that mobile devices are potentially as vulnerable to infection as their PC brethren. Nearly a decade ago, there was a spate of attacks that targeted mainly Symbian devices; the first was Cabir in 2004. Then, hackers found ways to insinuate spyware into phones, and media headlines

talked of malware that could convert a phone into a recording device or make expensive outgoing calls. Nevertheless, the threats never materialized in the numbers predicted, and news of mobile malware threats subsided.

The situation changed in early 2011, when numerous Google apps on the Android Market were found to be carrying malware. Those apps

were removed, but the threat from infected apps continues. Furthermore, our experts say mobile malware threats are far more prevalent than most users realize, and they will explode in 2012. As the most prevalent mobile operating system, says Dan Hoffman, chief mobile security evangelist for Juniper Networks (www.juniper.net), Android is more heavily targeted than any other OS.

WHO'S DOING WHAT

Hoffman says today's mobile malware threats are almost exclusively Trojan horse exploits designed with financial gain in mind. (A Trojan horse is a malicious program designed to conduct a malicious operation on the host device without the user's knowledge.) This is a radical shift from the early years of malware, when PCs were the main target. "If you look at hackers in the PC space, their goals were originally just to get attention. Then, they changed from notoriety to [being clandestine]," says Hoffman. "In mobile malware, there has never been any of that, 'Hey, I am here,' behavior with no other goal. It has always been about being as secretive and lucrative as possible."

Although Trojans are the near-universal weapon of choice when compromising devices, they fall into two general categories—spyware and SMS malware—based on their payloads.

Mobile spyware's purpose is to steal information, Hoffman says, whether it harvests data stored on the phone or records audio or video that might contain sensitive information. Spyware accounts for approximately 55% of all malware, according to statistics collected from Juniper users.

Equally insidious is SMS malware, which sends SMS messages to

Key Points

Infected Android applications are the most prevalent mobile malware threat at the present, but no device OS is inherently immune.

Infected Android malware increased by 472% from July to November 2011 alone.

Phishing, spam, and infected emails are also likely sources of infection, just as they are for PCs.

BYOD (bring your own device) policies are complicating matters for companies, which must secure the device in order to protect their assets.

fee-based numbers set up by cybercriminals. According to Hoffman, SMS malware can have far-reaching consequences. "These SMS messages aren't visible in [message logs]; they leave no record on the phone. Only if the user is insightful enough to notice them on his bill would he see them," says Hoffman. "The charges are small—maybe there are five or 10 \$2 charges."

that can download and install an app is susceptible," he says. "It's a misconception that Apple has a more secure process."

Furthermore, although malicious downloads from the Android Market currently account for most incidents, our experts predict other means of infection will gain more traction. As with PCs, users can also download

site) is hardly universal to PCs. As Google and Android app makers become more adept at finding and removing infected apps, prepare for malware writers to seek other outlets.

In fact, Hoffman notes, mobile users may be especially susceptible to email and browser ruses due to the smaller screens and compact formatting that mobile devices employ. "Users view a lot less information on a mobile device than they see on a PC," says Hoffman. "On your PC email or browser, seeing all the information might tip you off that an email is disingenuous."

Every expert with whom we spoke expects to see astounding growth of mobile malware—nearly all of which will be financially motivated Trojans—in 2012.

The payload for the criminal comes when he infects 10,000 or 100,000 phones, of course, and the monetary damage goes beyond the tricked user. Even more significant can be the impact on carriers. "People call to report the charges, and for the carrier the investigation turns into \$15-\$20 customer service incident," says Hoffman. "Once the money is paid, the number is gone and the person disappears anonymously." If such a scam—which Juniper reports currently constitutes 44% of infections—were to become widespread, the cost to carriers (and eventually their customers) could be enormous.

Trojans attached to email messages or hiding on infected websites, and phishing (where a faked email tricks a user into performing a dangerous behavior, such as visiting a malicious

NEW MODELS, NEW RULES

Finally, corporations must be cognizant of the changing landscape of mobile devices and how that impacts their vulnerability. Companies are struggling to define the rules around BYOD (bring your own device) scenarios, which save firms money but make them more vulnerable.

"BYOD really doesn't work at this stage," notes Allen Nogee, principal analyst for In-Stat (www.instat.com). "A few years from now better solutions will exist, where a smartphone may have a personal partition and a business partition, and a security policy governing it all, but the technology just isn't there yet."

Hoffman says that the concept of segregating personal and corporate data is a good one, but it is not enough. "Malware is attacking the whole device. If you think your corporate data is protected, it's easy to say, 'I don't care what is going on with the rest of the phone.' But, if the phone is infected with spyware that allows it to hear what is going on, your confidential information could still be compromised."

Our experts agree that one thing is certain. Malware writers and cybercriminals are having a field day getting rich on these exploits and they don't plan to hang their hats up, any time soon. ●

INTO THE FUTURE

Every expert with whom we spoke expects to see astounding growth of mobile malware—nearly all of which will be financially motivated Trojans—in 2012. Hoffman warns non-Android users not to assume they are safe. "The applications can be contact managers or a game; they can be known, respected programs that have been cracked or newly written software. And any device



Allen Nogee

principal analyst,
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"A few years from now better solutions will exist, where a smartphone may have a personal partition and a business partition, but the technology just isn't there yet."



Dan Hoffman

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"The applications can be contact managers or a game; they can be known, respected programs that have been cracked or newly written software. And any device that can download and install an app is susceptible."



Trusted Platform Modules, such as this one found on an Intel vPro motherboard, may soon appear in more mobile devices as security needs increase.

FUTURE-PROOF

Can You Keep Mobile Devices Useful For Longer?

If recent industry reports hold true, it seems that tablets have reached the point of outselling PCs. But the tablet market is no longer a one horse race, and between smartphones, netbooks, Ultrabooks, and all manner of other portable data devices, businesses find themselves facing the question of future-proofing. Should you buy as many bells and whistles as possible to help extend device longevity—or is that a potential waste of resources? What hardware features are most likely to deliver the longest-lasting bang for the buck? Does software influence long-term utility just as much as hardware?

FIGHTING UPSTREAM

In an increasing number of cases, such questions are moot. The BYOD (bring your own device) trend, also known as the consumerization of IT, is now embraced by an increasing majority of enterprises, according to new data from Avanade (www.avanade.com). Of more than 600 C-level respondents from 17 countries, 79% of companies will make new investments in embracing BYOD and roughly 60% are adapting their IT infrastructures to accommodate these consumer devices. This is a much harder task than might be apparent at first glance.

"Android has this fragmentation problem you hear about a lot," notes Mike Battista, research analyst at Info-

Tech Research Group (www.infotech.com). "You often don't know if any given device will be able to be updated in the future. If Google releases a new version of Android, there's no guarantee that any device will be able to take that update. Google leaves the updates in the hands of carriers and manufacturers. Apple, on the other hand, controls everything. Usually, they support two or three updates for any major device that you buy, ensuring that your device will be current for at least two or three years."

This is doubly significant given that third quarter 2011 data from Forrester Research (www.forrester.com) shows 26% of workers now employing Android-based phones and 22% using Apple's

iOS handsets. Collectively, this sets consumer phone adoption above the 42% reported by Forrester for Research In Motion's BlackBerry OS. (Note that Avenade's report places Android adoption above both BlackBerry and iOS, in that order.)

To deal with future-proofing against Android's fragmentation issue, digital strategy consultant Josh Lovison (www.joshlovison.com) leans toward recommending iOS due to "the linearity of hardware upgrades." For Android, though, he recommends that businesses try to settle on a specific handset manufacturer rather than deal with various custom OEM enhancements.

"Motorola in particular seems to have enhanced Android with a number of enterprise-minded additions," says Lovison. "Perhaps the most viable option would be investment into the Nexus line of devices. These are the devices that Google is most closely integrated with. A new one is released every year—the same upgrade cycle as the iPhone—they do not have any additional OEM 'bloat,' and are typically the first phones to receive Android software upgrades. Particularly if the enterprise is looking to develop in-house software for their mobile platform, the Nexus devices would be a good bet."

Lovison notes that until Microsoft has more than 10% of the market its mobile OS may not have viable staying power and that "RIM is on a serious decline that I doubt they can recover from." If Lovison is correct, then clearly one of the best future-proofing strategies could be one of platform avoidance. This would also apply to tablets and lower-end notebooks based on the same operating systems.

HARDWARE CHOICES

Conventional wisdom from PC buying says that the more you pay for key system components (i.e., CPU, storage, and memory) the greater the useful lifespan of the device. To a limited degree, this is true. We've been the unwitting victims of smartphones possessing such limited resources that, with

only a handful of applications installed, the device might take 30 seconds to return to its home screen and couldn't free up resources fast enough to let the user accept a phone call. Obviously, a faster (preferably dual- or multi-core) processor and more memory for apps and data will help here.

However, that old buying model originated in the days when the user experience depended on software leveraging local hardware resources. Now, more and more of the user experience is streaming down from the cloud, which means shifting priorities at the client end. Higher-end CPUs remain a necessity, but now this necessity is often to run the latest interface and browser capabilities rather than perform data crunching.

Predictably, with cloud dependency comes new emphasis on the data pipeline. "Whatever services aren't cloud-based probably will be soon," says Info-Tech's Battista. "So when you have video or other apps in which large amounts of data are being transmitted, then 4G/LTE becomes more of a consideration. But we're still in the early days there, so it's a bit of a risk to require that."

Just as the WAN (cellular) is critical, so is WLAN (Wi-Fi) connectivity. As Endpoint Technologies Associates (www.ndpta.com) owner Roger L. Kay points out, component vendors such as Qualcomm are already preparing technologies capable of 40Mbps speeds to ultramobile devices, but this will likely involve a multi-carrier approach sometimes called heterogeneous networking. Different data paths may go to outside carrier signals, indoor picocell signals, and indoor Wi-Fi access points, all operating in parallel for maximum connectivity and

throughput. This is why we're likely to see enterprise-oriented devices begin to emphasize multiple radio antennas in an attempt to optimize connection opportunities. For instance, today's top-end notebook Wi-Fi adapters feature three antennas whereas most tablets only integrate one, resulting in a substantial performance gap. Devices with more antenna diversity will likely fare better in future-proofing.

In addition, consider what business services the enterprise will need from its mobile users. Increasingly, hardware selections should be made with an eye toward targeting specific services that look to become more prominent in the company's operations.

"What services are you going to want tomorrow?" muses Kay. "Well, videoconferencing is a service. Data backup and archiving may be another. If everything goes to Web services—and I think it will—the browser has to work well. Security will be an issue, so look for better security components, such as Trusted Platform Modules. If future services include deeper levels of e-commerce, such as near-field communication purchasing,

electronic wallet—things that are coming soon here—you're going to need device support in more than just Ultrabooks."

Is it possible to overbuy when trying to future-proof? Certainly, and this is commonly done when not considering which services a given user will likely need within a device's two- to three-year expected life cycle. The needs of a C-level executive in the field will be very different from those of an inventory clerk in the warehouse, and one device size should not fit all. When future-proofing, look at anticipated services for guidance first, then target device components that will bolster those services. ●



Roger L. Kay
owner,
Endpoint Technologies
Associates

"If everything goes to Web services—and I think it will—the browser has to work well. Security will be an issue, so look for better security components, such as Trusted Platform Modules."

Laptop Power

How To Prolong Battery Life



If you're without an electrical outlet, a dead battery will transform even the best laptop into an expensive doorstop. There are many things you can do to reduce battery usage, from turning off non-essential applications to avoiding graphics-intensive software, but what about maintaining the battery for the long run? We spoke with Jeremy Carlson, battery technology engineer for Lenovo (www.lenovo.com), and looked at data from battery tester Cadex Electronics (www.cadex.com), to come up with several tips for keeping your laptop's battery running strong for as long as possible.

BATTERY USAGE

Because a laptop can draw power from both its battery and a wall outlet, it is easy to think that you could extend battery life by removing it when the laptop is plugged in. This isn't the case, and can cause problems you might not anticipate. "If the computer is used without the battery installed, there is no protection against the power being removed accidentally, causing a shutdown and potential loss of data," says Carlson. The ability for the laptop to seamlessly switch to battery power when this happens far outweighs any potential damage you might do to the battery by leaving it installed all the time.

Modern batteries also have electronic circuits that prevent them from becoming overcharged, and some laptops have technology specifically designed for long-term battery maintenance. "For someone who is using the notebook connected to AC most of the time, reducing the maximum charge threshold with an application like ThinkPad Power Manager will help prolong the lifespan of the battery," says Carlson. "I usually recommend 80% as a starting point for most users and then adjust that number up if it doesn't provide the necessary runtime when the computer is used on battery power." Check your laptop to see if it supports this type of battery management and adjust it so that the battery is not held at a 100% charge.

THANKS FOR THE MEMORIES

You may have heard that batteries develop a "memory" and won't charge past a certain point if you don't fully charge them each time you use them. In the past, when laptops used NiCd (nickel-cadmium) and NiMH (nickel-metal hydride) batteries, this was true, as crystals could form in the battery preventing them from accepting a full charge. Breaking up these crystal formations required repeatedly draining and charging the battery (called conditioning), and even when that was done the battery often wouldn't hold 100% of the charge it held when brand-new.

Today's laptops use li-ion (lithium-ion) batteries, which do not have the memory characteristics of older technologies. "It is not harmful to do small discharges and charges," says Carlson. As for conditioning, "It is not necessary to always do full charges and discharges. However, doing a full discharge and charge cycle periodically will help keep the battery fuel gauge accurate."

Here Carlson is referring to a coulomb counter, which tracks the charge going into the battery and the charge produced by the battery to provide the digital equivalent of a fuel gauge. Electronic devices use this reading to display the battery's charge level and

►► The Recharge Sweet Spot

Research by Cadex Electronics indicates that depleting the battery 100% between charges significantly decreases its overall lifespan. Charging when the battery reaches 50% is the sweet spot.

Depth Of Discharge	Discharge Cycles
100%	500
50%	1,500
25%	2,500
10%	4,700

perform operations such as deciding when to automatically shut down due to a low charge. The coulomb counter is not precise, and has a tracking error of approximately 1%, which accumulates into larger percentages over time if the battery is not fully discharged or charged frequently. A full discharge and charge cycle recalibrates the coulomb-counter and erases this tracking error, giving the computer a more precise picture of how much charge remains at a given time.

Don't fully discharge li-ion batteries often, however. Cadex researchers have found that the lifespan of li-ion batteries increases dramatically when they are recharged before they become fully discharged. Based on the company's analysis of 11 li-ion batteries from smartphones, discharging to 50% before recharging will likely extend battery life the longest. These same principles should extend to laptop batteries.

COOL IS THE RULE

Heat is death to batteries. It reduces their power at best, causes them to explode at worst, and should be avoided

at all costs. Never store a laptop in a hot car, and try not to work with laptops in hot environments. "Making sure that cooling vents are not blocked," says Carlson, "and having good power management profiles will keep the system components working as cool as possible, and will in turn keep the heat impact to the battery low." Processors and graphics hardware can heat up to the point that they melt if they are not ventilated properly, so try to use them on a flat surface in a cool room.

Batteries respond well to cool, dry places, so avoid heat and humidity. "We have some specialized customers that need to store their batteries for long periods of time. In those cases [we] have developed specific storage procedures to make sure the batteries are in the best possible condition when removed from storage," says Carlson. "What we recommend in these cases is to charge the battery to 50%, remove it from the computer, and store it in a cool environment. If being stored longer than six months, we recommend cycling the battery pack and charging back to 50% every six months."

Carlson also recommends removing the battery from the laptop if you plan to store the laptop for a long period of time, as "even in an off state the computer has some current draw and that will impact how long the battery can last before being over-discharged."

Research conducted by Cadex backed up this storage strategy. The company found that li-ion batteries, for example, lost 4% of their permanent capacity when stored for one year with a 40% charge at 77 degrees Fahrenheit, but 25% of their permanent capacity when stored for one year with a 100% charge at the same temperature.

Li-ion batteries also have a protection circuit that sometimes kicks in when the battery is disconnected but the charge drops below a certain level. This can make the battery appear dead when it is reconnected, and not all chargers will wake it up. That's another good reason to store the batteries with a 40% to 50% charge, so it takes longer for the protection circuit to activate due to energy drainage.

OUT WITH THE OLD

Batteries are chemical devices that degrade through use and aging, no matter what steps you take to prolong their life. "When your battery capacity has diminished and the runtime provided is no longer sufficient, it is time to replace the battery with a new one," says Carlson. It's an expensive proposition, but an inevitable one if you want to get the most out of your laptop. ●

►► Temperature Matters

You can lose up to 40% of a battery's permanent capacity in just three months if you store it with a full charge at a high temperature.

SOURCE: CADEX ELECTRONICS

Battery Temperature	Permanent capacity loss when stored at 40% state-of-charge (recommended storage charge level)	Permanent capacity loss when stored at 100% state-of-charge (typical user charge level)
0°C	2% loss in 1 year	6% loss in 1 year
25°C	4% loss in 1 year	20% loss in 1 year
40°C	15% loss in 1 year	35% loss in 1 year
60°C	25% loss in 1 year	40% loss in 3 months

Laptop Security

10 Best Practices

Laptop security is important both in the office and on the road. You have to make sure you have all your bases covered when it comes to antivirus software, email encryption, and much more. We'll show you what you need to keep your laptop safe and secure.

1 Install and upgrade antivirus software. Most viruses and malicious applications are designed specifically to steal information. For a company, that means hackers are going after credit card and account numbers as well as contact information and passwords for employees and customers alike. The first step you must take to combat these potential risks is to install a fully featured antivirus software suite and to keep laptops constantly updated. It's a good idea to use the identical program on every laptop in your company and find one with a centralized console or portal, so your IT department can easily monitor and administer it.

2 Install a program that will lock or "brick" your computer in case of theft. Sometimes it's nearly impossible to prevent your laptop from being stolen. And even though it is a worst-case scenario,

you should have a plan in place for how to handle this situation if it does occur. Many antivirus suites include features that will lock the contents of your laptop or render your laptop unusable, but there are also standalone programs available that will do this or even erase the contents of your hard drive as a last resort. The ability to remotely secure your lost or stolen laptop can prevent sensitive information, such as stored passwords, from falling into the wrong hands.

3 Don't email sensitive information and ensure all messages are encrypted. The best way to avoid leaking information via email is to never send passwords, payment information, or other data unless you have solid encryption and security in place. A lot can happen during the email transmission process and you can't be sure what security measures the email receiver uses; so you should

have the best possible encryption solution working on your end if you absolutely have to send this information via email.

4 Regularly back up your data. This is important for multiple reasons. For starters, establish a backup system and keep it up and running just in case there is a disaster that compromises your company's most crucial information. It's also good to have data backed up in case of a lost or stolen laptop. As we stated above, a situation may arise where you need to erase your hard drive and if you haven't backed up your stored information, you'll lose it forever. Most backup systems have automatic settings in place, so your employees won't have to remember to initiate backups and your company won't have to worry about losing data.

5 Strengthen your passwords for your laptop and applications. Almost every application, whether it's a program installed on your laptop or a Web-based program, requires that you set up a password. But if you use an identical password for every app or don't go out of your way to make them more complicated than "12345" then it may still be relatively easy for hackers to discover



it an infiltrate your personal data. Add a mixture of letters and numbers and use capital and lowercase characters. Some experts even suggest using three ordinary words in an unusual combination. If you're worried about forgetting your passwords, there are multiple programs available than can safely store them for you.

6 When there's a choice between wired and wireless Internet connectivity, use wired. Wireless networks can be dangerous, especially in public locations, because you never know who has access to the same network you're connected to. In fact, someone could simply drive by a coffee shop with free Wi-Fi, connect to the network, and steal information without anyone knowing. So connect to a wired network if at all possible, and if you must connect to a wireless network use one that is private and secure.

7 When using a wireless hotspot, make sure it's secure. In the event that you must use a wireless network connection and no secure Wi-Fi networks are available, you may opt for a wireless hotspot. Wi-Fi hotspots are great for connecting to the Internet via a mobile network, but you should always make sure they

are secure before using them. For instance, look for hotspots with built-in WPA/WPA2, authentication, and other security features that prevent unapproved outside access.

8 Don't leave your laptop unattended; or if you must, consider a keyed lock system. Whether you're at a coffee shop, airport, or other public spot, there could be opportunistic people just waiting to grab

■■■■■■■■■■
When there's a
choice between
wired and
wireless Internet
connectivity,
use wired.
■■■■■■■■■■

an unattended laptop. If you must leave your laptop somewhere for any period of time, you may want to invest in a laptop lock that prevents people from running off with your computer. Laptop locks can either be combination or keyed and work almost like bike locks to attach your computer to a desk or pole.

9 Don't store private network documents on your hard drive and use an encrypted private network to access work files. There may be times when you need to work on company documents while away from the office. Try to avoid storing sensitive shared documents on your hard drive because that is the first location that viruses will attack and the target for most hackers and thieves. A better alternative is to set up a private company network that employees can safely access from outside the company with a password. This ensures all files are in one safe location rather than stored on multiple machines.

10 Buy a case to protect internal components and prevent damage to your hard drive. This may seem like common sense, but a solid laptop case is actually the first line of defense in preventing data loss. Depending on expected work environments, you should invest in cases built with extra padding to protect the internal components of your laptop if dropped and weather-resistant materials for potentially harsh conditions. Many laptops are built to be tough on the outside, but the hard drive, motherboard, and other similar parts are still fragile. ●

Tablet Updates

You interact with your tablet's operating system every day, so you don't want to be left out of the loop when developers roll out intuitive new changes. Because we know you have other priorities, we researched the latest OS (and firmware) updates so your mobile device is an always-ready digital sidekick.

BlackBerry PlayBook users have reason to rejoice with the release of BlackBerry PlayBook OS 2.0, which is packed with new messaging, social networking, and productivity features. ←



→ The Acer Iconia Tab A500 isn't the first Acer tablet to receive Android 4.0, but it's in line to get the update sometime in April.

RIM RELEASES BLACKBERRY OS 2.0

RIM recently gave its PlayBook operating system a fresh coat of paint with the release of BlackBerry PlayBook OS 2.0. The update is designed to improve the social networking and communication capabilities of the tablet as well as add new features and functionality for personal and business use.

For messaging, BlackBerry PlayBook OS 2.0 features a unified inbox that collects your multiple email accounts as well as messages sent from Twitter, LinkedIn, and other social networking sites. It also has a management tool that lets you create out-of-office messages and signatures. RIM also integrated social networking into the preloaded contacts app and the calendar, which is now contact-based to make scheduling easier.

To help improve productivity, RIM upgraded the PlayBook's document creation functionality and Document To Go app with a better keyboard, in-depth editing tools, and more. Companies can also take advantage

of BlackBerry Mobile Fusion and BlackBerry Balance, which are both designed to make company-wide PlayBook deployment and management much easier.

BlackBerry PlayBook OS 2.0 also features BlackBerry Bridge, which lets you use your BlackBerry smartphone as a mouse and keyboard, share documents between devices, and much more. RIM's updated OS is available now for PlayBook owners.

SELECT ACER TABLETS TO GET ANDROID 4.0

Acer announced that it has begun the process of updating its Iconia Tab series of tablets to Android 4.0 (aka Ice Cream Sandwich). The first tablet to receive the update was the Iconia Tab A200 in February, but the company is expected to push updates to the Iconia Tab A100 and A500 in April. The Android 4.0 update brings all of its new built-in features to the Iconia Tab as well as a few unique to Acer devices, including the Acer Ring that improves menu navigation and app access.

TABLET MARKET SHARE

In the fourth quarter of 2011, Apple's tablet market share fell to 57% after claiming 64% in the previous quarter. But despite the lower market share, Apple sold more than 15.4 million iPads during the fourth quarter, a record for the company. During the same period, Amazon raised its share to 14% riding on sales of the recently released Kindle Fire. Rounding out the top four was the Samsung Galaxy Tab at 8% and the Barnes & Noble Nook at 7%.

FUJITSU MARKS DOWN Q4 2012 FOR WINDOWS 8 RELEASE

According to a leaked product release roadmap from Fujitsu, Microsoft will release Windows 8 in the fourth quarter of 2012, or possibly earlier. The roadmap showed that Fujitsu plans on releasing its own Win8-based tablet complete with the Metro user interface in Q4 2012. Microsoft recently released the Windows 8 Consumer Preview but hasn't announced an official release date for its newest operating system. ●

Top Tablet Apps



There is a seemingly endless supply of apps available for today's popular tablet platforms. In these pages, we have selected some of the best tablet apps for business, productivity, and travel. You'll find a mix of apps that are new or have been recently updated and apps that have stood the test of time and received high ratings from users.

SPLASHTOP REMOTE DESKTOP FOR IPAD

► iOS | \$4.99 | 4.6MB

Among the most popular apps for accessing remote computers, Splashtop Remote Desktop For iPad (Rel. Feb. 20, 2012) has recently been updated. It can now remember connection profiles and therefore establish remote connections more quickly. The updated version also includes the convenient option to

store security codes upon making a connection. And the new Trackpad Mode offers better cursor control. As with previous versions, the Splashtop app lets you access all of your desktop applications—including Microsoft Office programs, Web browsers, and Adobe Flash videos—via your iPad. Versions of the app are also available for Android, BlackBerry, webOS, and Windows.



Splashtop Remote Desktop
for iOS



Quickoffice Pro HD
for iOS



WiFi Finder
for Android



Adobe Debut
for Android

QUICKOFFICE PRO HD

► iOS | \$19.99 | 24.1MB

You might already be familiar with the Quickoffice app for mobile devices, which lets you view, create, and edit Microsoft Office-compatible documents, spreadsheets, and presentations. The newest edition of Quickoffice Pro HD for the iPad (Rel. Feb. 23, 2012) is a full version update (now 4.0) that primarily adds support for the Office 2010 versions of Word, Excel, and PowerPoint.

WIFI FINDER

► Android | Free | Size varies

Are there times when you could use some help finding a Wi-Fi hotspot or pinning down the nearest and strongest one from a list of many? JiWire, a company that has tracked Wi-Fi hotspots for years for its Web services and applications, recently updated its WiFi Finder app (Rel. Jan. 24, 2012) for Android tablets. Now with Android 3.0 (aka Honeycomb) support, WiFi Finder shows all available hotspots near your current location and provides the option to call, get directions to, or share hotspot locations. An iPad version is also available.

ADOBE DEBUT

► Android | \$9.99 | 15MB

Still in its original version, Adobe Debut (Rel. Nov. 15, 2011) from Adobe Systems has become a popular app for those using Android tablets with Android 3.0 or earlier. (There are some issues with Android 4.0 that should be corrected in a future update.) The app works in conjunction with the Adobe Creative Cloud service to display high-resolution versions of Creative Suite designs stored in Photoshop, Illustrator, or InDesign formats, as well as other image formats and PDF documents. The app includes a pen tool that you can use to add comments or otherwise mark up graphics.

SPRINGPAD

► Android | Free | 1.8MB

Another Android tablet app we're including because of its usefulness rather than its newness, Springpad (Rel. Nov. 8, 2011) is now among the highest-rated note-taking apps on the Android Market. Also available for the iPad, iPhone, and the Web, Springpad syncs your notes across multiple platforms, which makes it an excellent tool for jotting things down whenever you encounter them and recalling those things whenever you need to. You can add a steady stream of notes, graphics, and to-do lists to Springpad and use the search feature to quickly locate them later, or you can categorize notes as you go using customized notebooks and tags.

QUICK SALE PREMIUM

► iOS | \$29.99 | 5.1MB

Managing invoices on the go can be a pain. The goal of Quick Sale Premium (Rel. Feb. 24, 2012) from IntelliXense is to make it a breeze to create and send invoices, keep track of inventory and payments, make quotes and estimates, and perform other related tasks, all from your iPad. The app includes reporting features so you can easily create, email, and export sales reports, as well. A lower-cost version of this app is available to try, with an in-app option to upgrade to Quick Sale Premium. Premium capabilities include invoicing in PDF format and capturing signatures.

FLIGHTBOARD

► Android | \$3.99 | 4.1MB

As its developer Mobiata puts it, the FlightBoard app (Rel. Dec. 21, 2011) lets you transform your tablet "into the Arrivals and Departures board for any airport in the world." The app automatically updates every five minutes, drawing the latest flight status information from more than 4,000 airports and 1,400 airlines around the world. (It does not cover chartered flights.)



Springpad
for Android



Quick Sale Premium
for iOS



FlightBoard
for Android



Teambox HD
for iOS

The interface, the appearance of which is based on the arrivals/departures boards at Charles de Gaulle Airport in Paris, is simple to use. Enter basic information to access the appropriate airport, and then tap to switch between arrival and departure listings. The sharing feature lets you send flight information via email, text message, Facebook, or Twitter. FlightBoard is also available for the iPad.

TEAMBOX HD

► iOS | Free | 2.1MB

When collaborating on a team project, why endure the hassles of emailing back and forth when you can consolidate all of your project-related conversations, tasks, activities, and deadlines in one place? That's the question developer Teambox Technologies poses, and its answer is the Teambox HD app (Rel. Feb. 17, 2012) for iPad. Install the app on all team members' devices, establish sharing and cloud sync settings (the app supports Google Calendar and Google Docs, among other services), and everyone should be ready to collaborate.

MICROSOFT ONENOTE FOR IPAD

► iOS | Free | 5MB

If you're in the market for a note-taking app and you already use Microsoft Office and Microsoft's Web services, consider Microsoft OneNote For iPad (Rel. Dec. 12, 2011). Use the app to organize projects, create to-do lists, plan trips, and whatever else you can think of. You can then synchronize your notes with the online and desktop versions of OneNote. This app supports up to 500 notes, after which you must pay \$14.99 if you want unlimited capacity.

COMARKET

► iOS | Free | 3.9MB

Using membership and reward cards at select business establishments can produce a variety of benefits. But although such cards help you save

money and show loyalty, they also take up space in your wallet, purse, or pocket. In addition to replacing the plastic membership and reward cards, the CoMarket app (Rel. March 5, 2012) from Incware lets you receive digital coupons and special offers. What's more, every time you use the app with a participating company, that company will forward a donation to the charity of your choice. CoMarket is also available for Android devices.

PROINSIGHTS FOR BLACKBERRY PLAYBOOK

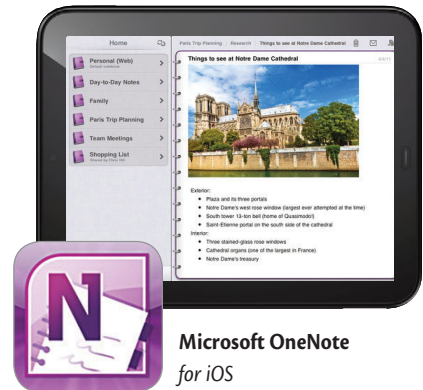
► BlackBerry | \$4.99 | 9.3MB

LinkedIn is a fantastic networking tool, but if you don't feel that its mobile versions provide you with all of the information you want to see in an instantly usable format, try ProInsights For BlackBerry PlayBook (Rel. Jan. 30, 2012) from XLabz Technologies. ProInsights applies an "infographic" approach to your LinkedIn account. Simply download the app, sign in, and ProInsights gets to work organizing your LinkedIn data and your connections' LinkedIn data. You can then flip through your connections in a card deck view, get a snapshot look at where your connections are on a map, and perform advanced searches, among many other features.

NETWORK MANAGER

► BlackBerry | \$1.99 | 2.8MB

If your company uses BlackBerry PlayBook tablets, your network administrators will appreciate having the Network Manager app (Rel. March 8, 2012) from Five Seasons Computer. The app provides a quick view of essential network and user information, including IP addresses, account names, user passwords and addresses, and wireless device names. Network Manager also includes a speed test feature that lets administrators determine data transfer and network speeds. ●



Microsoft OneNote
for iOS



CoMarket
for iOS



ProInsights
for BlackBerry



Network Manager
for BlackBerry

Smartphone Updates

You probably rely on your smartphone for many things, and with updates, you can improve both the efficiency and functionality of your mobile phone. We'll detail newly released updates to help you maximize the use of your smartphone while you are on the road as well as keep you up-to-date on smartphone-related news.

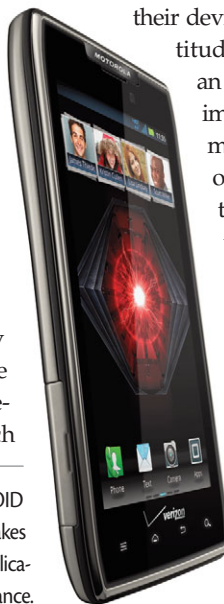
ADOBE FLASH PLAYER SECURITY UPDATE

Adobe recently released an important security update for its Flash Player software aimed at fixing vulnerabilities for PC and Mac users as well as owners of Android devices. According to the company, these security issues were found through internal tests and fixed before affecting users. Adobe also patched a few bugs and added additional support for Android 4.0 (aka Ice Cream Sandwich) devices, including improved video playback functionality. The update is available now for Adobe Flash Player 11 users.

MOTOROLA RAZRS RECEIVE SOFTWARE UPDATES

Verizon Wireless announced an extensive software update for both the DROID RAZR and DROID RAZR MAXX Android smartphones aimed at fixing data connectivity-related issues and more. The update contains operational upgrades, such as improved battery life when using Bluetooth headsets and better stability when swiping through home screens. Verizon made enhancements to preloaded apps such

The recent Verizon update for the DROID RAZR and DROID RAZR MAXX makes improvements to data connectivity, applications, and overall device performance.



as Mobile Hotspot, VZ Navigator, Visual Voice Mail, V CAST, and MotoCast. The company also improved data connectivity after disabling Airplane Mode and boosted performance for smartphone usage in less-than-optimal 4G coverage areas.

SAMSUNG INFUSE 4G GETS GINGERBREAD

Owners of the Samsung 4G Infuse smartphone (originally released in May of 2011) can finally look forward to installing Android 2.3.6 (aka Gingerbread) on their devices. The upgrade adds a multitude of new features, including an improved onscreen keyboard, improved battery life and power management, access to previously unsupported applications, and much more. At the time of this writing, Samsung put the update on hold due to reported issues from some users, but the company is currently working to fix it.

SAMSUNG'S STYLISH & TOUGH MEMORY CARDS

Samsung is pushing the limits of memory card stability and reliability



After being on the market for almost a year, the Samsung Infuse 4G is finally getting an Android 2.3.6 (aka Gingerbread) update.

with its new line of High Speed Series and Extreme Speed Plus+ Series SD and microSD cards. The company's new cards are designed to be magnet-proof, waterproof for up to 24 hours, and shockproof enough to survive the weight of a 1.6-ton vehicle.

But they are also fast, reaching read speeds of up to 24MBps on 4GB or higher cards and write speeds of up to 21MBps on Extreme Speed Plus+ Series cards. Samsung's new memory cards range in price from \$9.99 to \$89.99 and are available in sizes of 2GB up to 32GB.

T-MOBILE WORKING TOWARD LTE IN 2013

In T-Mobile's Q4 2011 earnings report, the company announced its plans to launch its LTE network in 2013. And although the earnings report showed a 2.7% drop in service revenues and a loss of just over 700,000 contracted customers, the company hopes its new focus on its high-speed 4G network will bring them back. T-Mobile will also be releasing new devices and services in 2012 in order to compete with other major wireless service providers. ●

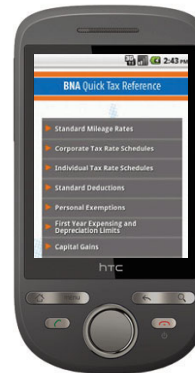


Top Smartphone Apps

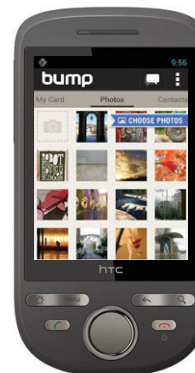
Choosing an app that fits your needs can be an overwhelming task as the number of available apps increases daily. We browsed a variety of websites and selected some of the best applications for business, finance, productivity, and travel. In the pages that follow, we highlight a mix of those that are new or recently updated.



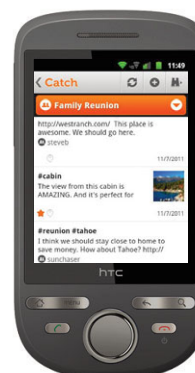
abcNotes—
Checklist & Sticky
Note Application
for iOS



Bloomberg BNA
Quick Tax
Reference
for Android



Bump
for Android



Catch Notes
for Android

ABCNOTES—CHECKLIST & STICKY NOTE APPLICATION

► iOS | \$2.99 | 19.1MB

Using a realistic sticky notes look and feel, this app (Rel. Feb. 15, 2012) from ALSEDI Group aims to be a “stylish and highly customizable” assistant for taking notes and managing to-do lists. Beyond 88 background options and 115 available icons, the app provides 45 skins for notes; 15 virtual desktops; the ability to scale, rotate, and drag notes; and the capability to edit, duplicate, and move notes between desktops. The app works with iCloud synchronization to enable sharing between iOS devices.

BLOOMBERG BNA QUICK TAX REFERENCE

► Android | Free | 128KB

Quick Tax Reference (Rel. Jan. 4, 2012) from Bloomberg BNA includes scads of current tax information for tax rates spanning from 2007 to 2012 that is accessible from a mobile device. Additionally, the app provides information relating to corporate and individual tax rate schedules, income tax rates for estates, standard mileage rates, retirement plan limits, and capital gains and dividends taxed as net capital gain. A slider bar feature, meanwhile, provides an easy-to-use tool to input numeric information.

BUMP

► Android | Free | 2.6MB

The latest version of Bump Technologies’ well-regarded and popular Bump app (Rel. March 9, 2012) still enables users to share photos, contacts, and apps by simply bumping phones together, but now features a new design and the ability to share as many photos as desired, sync devices, and discover mutual friends. Bump will work across all Android and most

other modern mobile phones, including iPhones.

CATCH NOTES

► Android | Free | Size varies per device

Catch.com’s Catch Notes (Rel. Jan. 27, 2012) lets users capture and securely share ideas, photos, voice memos, maps, and reminders via a cloud-based, auto-syncing approach. Further, the app enables gathering private and shared “Streams” into collections that users can store or share for collaboration purposes. Other abilities include emailing notes and scanning product barcodes to capture gift ideas. Upgrade to a paid Catch Pro or Catch Premier account to add more capacity and other abilities.

CLEAR

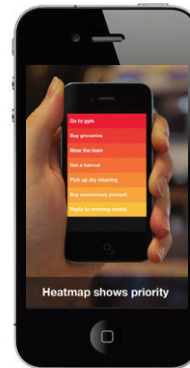
► iOS | \$1.99 | 7.1MB

Clear (Rel. Feb. 16, 2012) from Realmac Software promises to put a twist on to-do lists by providing a clean, streamlined, simple way to create and check off items for shopping, grocery, business, and other list types. Creating items is as easy as pulling down the menu, and a Heatmap feature uniquely displays the priority of given items using a color scheme. Swipes and pinches, meanwhile, are used to check off items and alter lists.

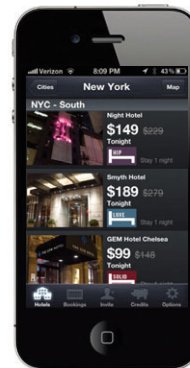
HOTEL TONIGHT

► iOS | Free | 6.9MB

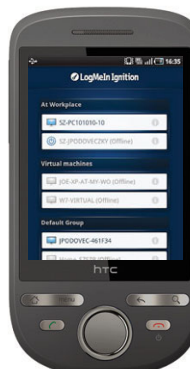
Offering listings for hotels in dozens of U.S. cities, including hotels near airports, Hotel Tonight (Rel. Feb. 6, 2012) from DealBase helps users find same-day hotel rooms priced at up to 70% off normal rates. DealBase says it personally vets the hotels and can provide bookings until 2 a.m. New in the app’s latest version is the ability to review hotels following



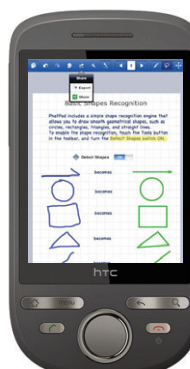
Clear
for iOS



Hotel Tonight
for iOS



LogMeIn Ignition
for Android



PhatPad
for Android

a stay and access to social networking features, including Facebook, Foursquare, and Twitter.

LOGMEIN IGNITION

► **Android** | \$29.99 | 2.5MB

LogMeIn Ignition (Rel. Jan. 17, 2012) from LogMeIn enables you to remotely control multiple computers (Mac or PC) from an Android device (1.5 or higher). Support for CRM, ERP, Microsoft Office, and other software is included. Usage requires creating a LogMeIn account, installing the free LogMeIn software on the computers you want to control, and purchasing and installing the app. A LogMeIn Pro account adds file transfer, remote printing, remote sound, and other premium features.

PHATPAD

► **Android** | \$4.99 | 5.6MB

Using PhatWare's handwriting recognition technology, PhatPad (Rel. Feb. 1, 2012) provides users with a note-taking and collaboration platform that supports drawing, writing, and typing ideas on mobile devices and sharing that content via email or Dropbox. In addition to automatically turning handwritten notes into digital text, the app can transform objects into formed shapes. Users can add voice notes and images to document pages, as well.

PRESENTER

► **Windows Phone 7** | \$2.99 | 1MB

This app (Rel. July 30, 2011) from SmartShare is billed as an easy-to-use "Windows Phone 7 remote control for PowerPoint." Control occurs via Wi-Fi connectivity. In addition to controlling PowerPoint slides, the app includes an Autoplay feature. Support for Microsoft Office 2007 through 2010 is included, and SmartShare also

offers a free Presenter Lite version with support for up to 15 pages.

UBER

► **iOS** | Free | 2.6MB

If cab rides just aren't cutting it any longer, this app (Rel. March 6, 2012) from Uber Technologies puts on-demand access to a private driver within reach of your iPhone. In addition to handling payment for the service through credit card (no exchange of cash required), other functionality includes setting your location, sending a request, and rating drivers.

WIKITUDE

► **Windows Phone 7** | Free | 1MB

Wikitude (Rel. Jan. 9, 2012) claims to let users browse more than 150 million points of interest and interactive content from 2,500-plus content providers. With the help of the device's camera, location services, compass, and other device features, the app uses Augmented Reality technology to show users what's around them when holding up their mobile phones, such as ATMs, restaurants, events, and user reviews. Search abilities and access to coupons are also included.

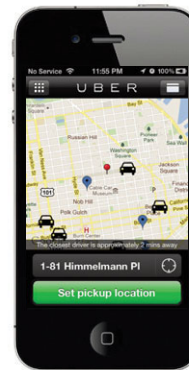
LEMON

► **iOS** | Free | 4.7MB

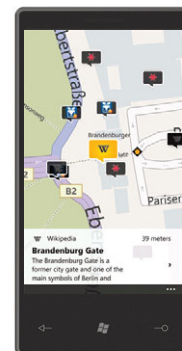
Lemon (Rel. Feb. 12, 2012) gives users a method to track expenses by scanning an unlimited number of receipts (manual entry is also supported). Features include the ability to assign labels and categories for various types of spending, view spending summary reports, export receipt scans, store receipts with SSL encryption, and capture merchant-related data. Premium features are available by subscribing to the optional Data, Family, or Business plans. ●



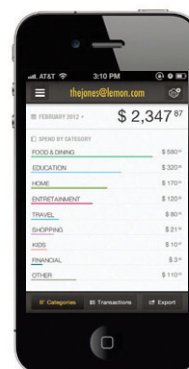
Presenter
for Windows
Phone 7



Uber
for iOS



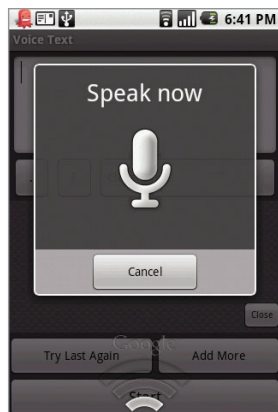
Wikitude
for Windows
Phone 7



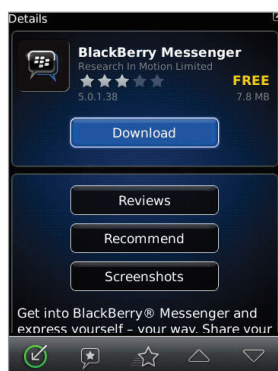
Lemon
for iOS



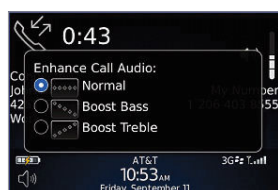
Smartphone Tips COMMUNICATIONS ADVICE



Don't type, talk!



To Ping your BlackBerry Messenger contacts, first make sure you have the app on your device.



BlackBerry users can boost the bass or treble of their calls.

ANDROID

► Automatically & Manually Merge Contacts

Android users can make short work of merging contacts, or combining the multiple duplicate entries for a single person that commonly occurs when you import contacts from multiple sources. To automatically combine contacts, log into your Gmail account on a PC, click Contacts, click the More Actions button at the top of the screen, and then select Find & Merge Duplicates. When the action has been completed, Gmail provides you with a report of how many contacts were added and how many of the contacts were merged. Typically, a handful of contacts will not be merged, but you can manually link these from your Android device. Start by tapping the Contacts icon on the Home Screen, tap a contact you want to manually merge with another, press the Menu key, tap Link Contact, begin typing the name of the second contact and then scroll to and tap the appropriate entry from the screen. Repeat this process for each of the remaining contacts you need to manually link.

► Voice Input

If you're using a handset running Android version 2.1 or newer on it (you can tell by pressing the Menu key, tapping Settings and About Phone, and then looking for the Android Version), then you can speak to input text in any text box. To try it out, the next time you tap a text box to input an address, search term, or virtually anything else, tap the microphone icon and speak instead of typing. In most situations, you can save time by speaking your input and selecting the option that best matches your spoken command.

BLACKBERRY

► Explore Your Browser History

We love the mobile Web. But if you've ever hastily closed a mobile browser and forgotten to bookmark that cool new site you just discovered, the History function makes it easy to find

again. To access your History, simply launch the Browser, press the Menu key, and select History. Here you'll find the sites you've browsed categorized by date and grouped by the parent URL. Select the one you want to revisit and it will load. If you like, you can bookmark it by pressing the Menu key and selecting Add Bookmark.

► Ping A Contact

BlackBerry Messenger has a unique feature that lets you notify fellow Messenger users that you'd like to chat. First add one or more contact(s) to your BlackBerry Messenger account by pressing the Menu button, selecting the Instant Messaging folder, and launching the BlackBerry Messenger. Press the Menu button again; select Add A Contact; and then type the PIN, email address, or name of a BlackBerry Messenger-enabled contact. You can edit the confirmation request text or leave it as-is; when you're ready to send the request, just select Send. Once confirmed, you'll be able to see when the contact is available for chat. Sending the contact a Ping makes their BlackBerry vibrate, notifying them that you want to chat. To use the Ping Contact feature, highlight one of your confirmed BlackBerry Messenger contacts, press the Menu key, and then select Ping Contact.

► BlackBerry Speed Dial

Your BlackBerry has the ability to automatically dial the number of your choice by simply pressing and holding a key. By default, the Q, W, and A keys are reserved for switching between Normal and Vibrate Only profiles, calling voicemail, and locking the keypad, respectively. To make any of the remaining keys a speed dial key for

one of your contacts, press the Menu key and select Options. If you're using a BlackBerry running a BlackBerry OS version earlier than 6.0, scroll to and select Phone Options and then select Speed Dial Numbers. For BlackBerry OS versions 6.0 and later, scroll to and select Call Management and then select Speed Dial Numbers. Next, scroll to and select an unassigned letter or number, choose a contact from the list, and then select the phone number you want to dial

whenever you press and hold the corresponding key. Confirm your selection and you're done.

► Add Notes To A Call Log

Email is great because it is an easily searchable text record of everything communicated, categorized in chronological order. Your call logs, however, are significantly less informative. But BlackBerry users can attach notes to call logs to describe what was discussed in the conversation, indicate when to call back, whether or not you left a voicemail message, and more. To add a note to a call log, press the Send key from the Home screen, highlight a call log, press the Menu key, select View History, highlight the particular call you want to add the note to, press the trackpad, press the Menu key, and then select Add Notes. Then just type your call notes. When you're finished, press the Menu key and select Save. Now, in the call log menu, calls with notes will feature a green icon indicating as much.

IOS

► Silence Calls & Forward Them To Voicemail

When your iPhone rings, you can immediately silence the ringer by pressing the Sleep/Wake button once. Rather than leave the caller suffering through

multiple rings if you don't intend to answer, you can forward the call directly to voicemail by pressing the Sleep/Wake button twice.

► Improve Call Sound Quality

The call quality for Bluetooth headset users is fixed, but if you talk on your BlackBerry the old fashioned way (by holding it to your ear), then you might be able to improve the call quality. While you're on a call, simply press the Menu key, select Enhance Call Audio, and then choose between Normal, Boost Bass, or Boost Treble options.

To change call quality for all calls, start by pressing the Send key while viewing the Home screen. Press the Menu key, scroll to and select Options, select General Options, and then scroll to the last two entries in the menu: Enhance Handset Call Audio and Enhance Headset Call Audio. Highlight the option adjacent to the call type you want to modify, press the trackball or trackpad, and then select between Previous, Normal, Boost Bass, or Boost Treble. When you're finished making selections, press the Menu key, and then select Save.

► Mass Deletion

When deleting text in a message, email, or other location that allows text input, pressing and holding the Delete button will slowly delete the text letter by letter. If you continue to hold down the Delete button for longer than it takes to delete a line of text, the action will begin deleting text more quickly, word by word rather than letter by letter.

WEBOS

► Rename Your Email Accounts

Palm Synergy lets you sync multiple email addresses to a unified inbox on your webOS-based device. You can configure each email service to perform differently by changing the settings within each account. To get started, launch the Email app by tapping the envelope icon on

Rather than leave
the caller
suffering through
multiple rings if
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intend to answer,
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the call directly
to voicemail
by pressing the
Sleep/Wake
button twice.

the Home screen. Next, open the Email menu by tapping the top-left corner of the screen, tap Preferences & Accounts, select the account you want to modify from the Accounts submenu, and scroll down to view all the options you can change. By default, the account is named for the service associated with it, such as Gmail or Microsoft Exchange, but you can change the name of the account by tapping the topmost menu item and typing a new name. Tapping the Full Name option below lets you change the name on the account.

► Adjust Email Icon Notifications

To get started, launch the Email app by tapping the envelope icon on the Home screen. Next, open the Email menu by tapping at the top-left corner of the screen, then tap Preferences & Accounts, select the account you want to modify from the Accounts submenu, and then set the Show Icon feature to On to get a visual notification whenever you get a new email from this account. When set to Off, no notification will appear. You can also change other settings from here, such as Vibrate, System Sound, Ringtone, or Mute for audio and tactile cues.

► Change Your Email Signature

You can change the signature on your webOS-based device, which is a short text message that automatically appears at the end of any email message you send. To do this, tap the envelope icon on the Home screen, the Email menu icon at the top-left corner of the screen, and Preferences & Accounts. Select the account you want to modify from the Accounts submenu, and then tap the text box below Signature. Type your new message, and then just navigate away from the text box to finish.

► Change The Reply-To Address

To change the Reply-To address when responding to an email message, tap the envelope icon on the

Home screen, the Email menu icon at the top-left corner of the screen, and Preferences & Accounts. Select the account you want to modify from the Accounts submenu, and then tap in the appropriate text box. Input the address to which you want replies sent.

► Remove An Email Account Or Update Password

If you have long since stopped using a Web mail client, it's easy to remove it from your webOS-based device. Tap the envelope icon on the Home screen, the Email menu icon at the top-left corner of the screen, and Preferences & Accounts. Select the account you want to modify from the Accounts submenu, and then tap the Remove Account button. The Change Login Settings button grants you access to the password, username, SSL, and mail server settings. On a separate note, if you continue to use Web mail clients and have updated their passwords, you can input the new password here to maintain service through your smartphone.

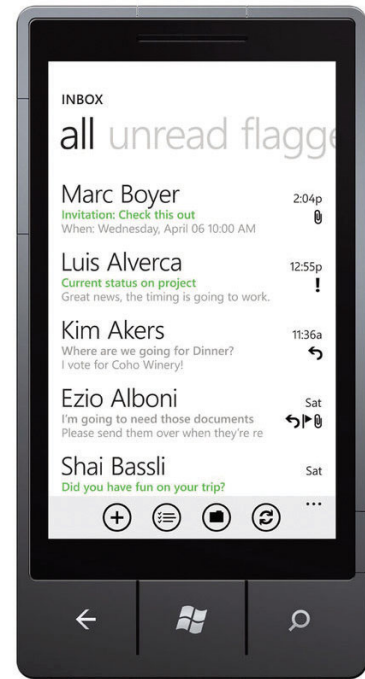
WINDOWS PHONE 7

► Delete Email In Bulk

To quickly delete a single email, on Start, tap an email account that has the unwanted email(s), tap on the email you want to delete, and then tap Delete. To trash multiple emails simultaneously, tap to the left of the email author to display a row of checkboxes beside each email. Next, tap the checkboxes that correspond to each email you want to delete and then tap the Delete icon (a trash can) to complete the operation.

► Share Images In Text Messages

With Windows Phone 7, it's easy to add an image to a text message, which makes it an MMS (Multimedia Messaging Service) or multimedia message. To compose and message with a fresh photo, on Start, tap Messaging and New. Type the message recipient's name, mobile phone number, or email address in



You can batch delete emails on Windows Phone 7 devices.

the To field; tap Attach; and then tap Camera. Then press the camera button to take a picture. Tap Accept, tap the message box, type your message, and tap Send.

You can also send text messages with an image from your saved Pictures folder. To do this, on Start, tap Messaging and New. Type the message recipient's name, mobile phone number, or email address in the To field; tap Attach; and then tap the album that contains the picture you want to send. Select the picture you want to share, tap the message box, type your message, and then tap Send.

You can also perform this operation from the Pictures hub. On Start, tap Pictures, tap the album that contains the picture you want to send, tap and hold the picture, tap Share, and then tap Messaging. Input the recipient's name, phone number, or email address in the To field, tap the message box, type a message, and then tap Send. ●

DIGITAL *Diversions*

ZAGG'S IFROGZ BOOST HOPS FOR NEARFIELD JOY

► Released under the iFrogz brand name, Zagg's Boost NearField Audio speaker (\$39.99; www.ifrogz.com) couldn't be much easier to use. Just place your mobile phone or any other device with an external speaker on top of the brick-shaped Boost (measuring roughly 5 x 3 x 1 inches [HxWxD]) and the speaker uses patent-pending NearFA technology to sync the audio signal emitting from the mobile device and amplifies it through the Boost's two 2W speakers. As iFrogz states, "No wires. No Bluetooth. No syncing." (The Boost does sport an auxiliary line-in jack to connect to devices that lack an external speaker.) Expect up to 15 hours of playtime from the three AA batteries that are required to power the Boost. Alternatively, listeners can power the speaker using an optional micro USB cord.



NUFORCE PUT THE CD-QUALITY IN WIRELESS AUDIO STREAMING

► If for whatever reason you've been searching for a solution that lets you wirelessly stream music in CD quality as you walk from one office to another, NuForce (www.nuforce.com) has the answer with its Air DAC Wireless System. The system uses the new hi-fi SKAA (www.skaa.com) audio standard that was "created specifically for personal portable devices" and involves plugging a transmitter either into an Apple mobile device (iTX model; \$79 separately) or a computer's USB port (uTX; \$59 separately). Once that's accomplished, audio from those sources streams over the 2.4GHz radio band to an Air DAC (\$149) receiver with no latency or interference or software or pairing required, NuForce claims. The company also states that each transmitter can beam audio to four receivers, and each receiver can connect to up to four transmitters. The uTX transmitter provides a wireless range that spans 15 to 30 meters, while the iTX covers a distance of roughly 10 to 20 meters. NuForce bundles the uTX with the Air DAC for \$179 or the iTX with the Air DAC for \$199.



SENNHEISER'S RS 220 HITS THE WIRELESS AIRWAVES

► Historically, audiophiles have frowned on the audio quality that wireless headphones using the 2.4GHz radio can produce. Sennheiser (www.sennheiserusa.com) aims to change such notions with the RS 220 (\$599.95). Based on acoustics featured in the company's well-regarded HD 600 and HD 650 cans, the RS 220 relies on DSSS (Direct Sequence Spread Spectrum) technology to receive uncompressed digital signals from the accompanying TR 220 transmitter/charger base station with what's billed as being noise-free reception. The wireless transmitter-to-headphones range is stated to cover up to a 300-foot line-of-sight range (though a 30- to 100-foot range is listed as being typical in common listening spaces). The TR 220 includes optical and coaxial digital inputs, as well as analog RCA inputs (coaxial and RCA cables included). Elsewhere, the RS 220's rechargeable NiMH batteries provide power for approximately six to eight hours, while the headphones (11.1 ounces) feature an open-air, over-the-ear design; tactile volume, audio source, and balance buttons; velour ear pads; and an adjustable band with spring-loaded earcup swivel mounts.



PENTAX RICOH GOES VERTICAL WITH THE OPTIO VS20

► The new Pentax Ricoh Optio VS20 (\$249.95; www.pentaximaging.com) sports a feature you won't find on many, if any, other compact digital cameras: a second, vertical shutter-release button with zoom lever. The addition makes shooting portraits, architecture, and other vertically oriented shots a convenient snap. There's even a vertical tripod socket built-in, as well as an accelerometer to correct the image's orientation when the camera is flipped. Elsewhere, the Optio VS20 serves up a 20X Pentax optical lens (28-560mm equivalent) for wide-angle to super-telephoto shooting needs; 3-inch, 170-degree angled LCD with anti-gloss coating; and 16MP CCD sensor with mechanical sensor-shift shake reduction that enables non-blurry images in low light. Beyond capturing 720p HD movies (a separate movie recording button is integrated), the VS20 offers an Auto Picture mode; 15 shooting modes; and 13 scene modes, including a Handheld Night Snap mode.



BIOLITE OFFERS UP THE MOBILE PHONE-LOVING CAMPSTOVE

► Before you and your team head off for another brain-storming retreat in the wilderness, consider doing yourself and the environment a favor by picking up a CampStove (\$129) from BioLite (www.biolitestove.com). Beyond being able to quickly boil water and cook meals using only the twigs, pine cones, and branches you find while on your daily hike, the CampStove uses a portion of the energy that the fire inside the stove produces to charge USB-based smartphones, GPS devices, LED lights, and more. Further, unlike an open camp fire that wastes a significant portion of the fire's energy while generating smoke that's detrimental to the environment, the CampStove generates its energy cleanly. When not in use, the CampStove folds up for convenient storage and travel and weighs just over 2 pounds.



Mobile Devices & HDMI

Connect & Share What's On Your Display



Being mobile doesn't mean you have to give up your large-screen, HD television. You can connect your laptop, tablet, or smartphone to an available HDTV at a hotel, resort, or other venue. What makes connecting a mobile device to an HDTV so appealing is the simplicity. Most popular mobile devices have an HDMI-compatible output. All you need is an HDMI cable or adapter and an HDTV or projector.

WHAT IS HDMI?

HDMI (High-Definition Multimedia Interface) cables let you send high-resolution video and multichannel audio from one device to another over a single cable. HDMI is strictly digital and doesn't use any compression, so the result is high-quality image and sound.

HDMI is often seen as the connection of choice for hooking up an HD cable box, DVD/Blu-ray Disc player, or home theater receiver to an HDTV, but it has grown far beyond that. HDMI allows the convergence of PCs, mobile devices, and HDTVs by standardizing a single high-quality interface for all of the individual components.

HDMI started as a replacement for bulky video and audio connection systems that were a carryover from earlier TV standards or from computers and displays. It wasn't unusual to connect an HDTV to other devices using Component Video (a three-cable analog connection), along with a 6-cable (5.1 audio) or 8-cable (7.1 audio) connection for audio. That's a lot of cables, and that's just for one connection. If you had multiple sources, you'd need multiple connections.

HDMI wasn't the first solution; DVI (Digital Visual Interface) preceded it. DVI allowed high-resolution analog and digital video to be delivered to a monitor or TV using a single cable. That got the video down to a single cable, but it was a bulky one, because it contained as many as 29 individual wires. And there was still the issue of all those audio cables.

HDMI solved the problem by providing high-resolution, high-bandwidth audio and video in a single,

small, easily pliable cable. Some HDMI cables are less than 2mm thick. They're not only easy to use, but they are easy to pack when you travel.

HDMI supports DVI, so you can connect any DVI device, such as an older laptop, to an HDMI device with a simple cable adapter.

HDMI & MOBILE DEVICES

Regardless of the type of device, if it has the ability to connect to an external display or HDTV, chances are HDMI is involved. In many cases the manufacturers of mobile devices will ship HDMI cables or adapters with their devices. If not, then you can find cables and adapter at local stores and online.

Laptops. Connecting a laptop to an external monitor or HDTV is a piece of cake with the correct cable or adapter. Most laptop manufacturers are physically large enough that the manufacture will include on the case either an HDMI connector or one of the common alternate display connectors that are compatible with HDMI, usually DVI-D or Mini DisplayPort. Both connection options require an adapter or a cable with the appropriate connectors at each end. There is no conversion process required, because the signals generated by the laptop on these connectors are already HDMI-compatible; they're just a different type of connector.

Tablets. Tablet manufacturers know that while tablets are a handy form factor, they're a poor choice for sharing a display with others. That's why many tablets have the ability to mirror what you see on its display onto an external monitor or HDTV. Tablets may have a dedicated HDMI connector or a Micro HDMI connector. Some tablets, such as Apple's iPad, have a connection system that is compatible with an external HDMI device, but it requires an adapter to make the connection.

Smartphones. HDMI is available on smartphones as well, usually in the form of Mini or Micro

HDMI connectors. Apple's iPhones and smartphones that use the Android OS from Google all have support for video out. This capability is available on other smartphones, as well, including some BlackBerry models.

Some recent smartphones have an MHL (Mobile High-Definition Link) connector that looks like a micro USB port. MHL connectors are different from HDMI, but in one important aspect, they are similar: They just need a cable or adapter to make the connection to an HDMI port. Some adapters make the necessary connection and also provide power to keep your smartphone charged.

THE BIG PICTURE

Now that you have your mobile device connected to a big screen or projector, you may be curious as to what you can do or expect?

Smartphones generally let you mirror the phone's display on an external monitor or HDTV, but they rarely deliver HD-level content. Many smartphones can output at 480p, roughly equivalent to EDTV (enhanced-definition television); some can go as high as 720p. In some cases, output resolution is dependent on the content you're viewing on the smartphone. You may be able to watch a movie or play a game at 720p, but when you mirror the smartphone's screen, you may see a much smaller image on the external display. It depends on the smartphone and the app you're using when you're displaying to an external device.

As smartphones become more powerful and the demand for working with external devices grows, most smartphones will be able to generate true 1080p HDTV output. In the meantime, you may be pleasantly



The Verizon Motorola Droid Razr MAXX and Samsung Galaxy Tab 10.1 are examples of mobile devices that have HDMI support.



surprised at how well your smartphone display can look on an external device, at least when using some smartphone apps.

Tablets and laptops, on the other hand, can generally drive an external HDTV at 1080p, giving you the full depth and realism you expect on an HDTV. Even 720p looks great on the big screen, and it is quite a step up from the small display on a tablet or laptop. Tablets and laptops also have a lot of storage, so you can load up your favorite movies, TV shows, and games. Laptops, tablets, and most smartphones also the ability to stream content from YouTube, Netflix, and other sources.

NOT JUST FOR ENTERTAINMENT

For savvy business users who need to impress potential customers, a mobile device paired with an external projector or HDTV is a presenter's dream. Most business venues have an HDTV or projector system available, and in most cases, they accept HDMI inputs. If not, you can invest in a portable projector to ensure you're ready for anything. ●

Digital Cameras & Camcorders

A Feature-By-Feature Guide

The best camera or camcorder for you depends entirely on how you plan to use it, and often it boils down to whether you value versatility or portability. In this article, we'll explain what to look for when shopping.

TYPES OF CAMERAS

► Most digital camcorders are small and light, but digital cameras vary greatly in size and weight.

The biggest, heaviest cameras are DSLR (digital single-lens reflex) models that use a mirror and a prism to let you look through the optical viewfinder and see exactly what image is coming through the lens. DSLRs accept a variety of lenses, which makes them versatile but adds to their expense. DSLR cameras also vary in size, from the larger full-frame models with the largest sensors (more on that later) to small models with smaller sensors. There are also newer mirrorless designs (sometimes called Four Thirds models) that dispense with the mirror and prism (and often the optical viewfinder) to substantially decrease size and weight, but they are slow to focus relative to their larger cousins.

Compact point-and-shoot cameras have improved in quality dramatically throughout the years, but have tiny sensors, focus relatively slowly, and don't have as many accessories compared to DSLRs. They also lack swappable lenses. You must weight these disadvantages against the convenience of portability.

RESOLUTION & SENSOR SIZE

► Although many manufacturers tout the MP (megapixel) rating of a camera or camcorder, MP is one of the most irrelevant specifications. It tells you only the number of pixels (picture elements) the sensor can capture, but nothing about more important features of the sensor (such as physical size) that contribute to image quality.

Getting great pictures is all about capturing as much light as possible, and a smaller sensor with a high MP rating will always capture less light than a larger sensor with a smaller MP rating. Larger sensors also allow for less noise (the little speckles of color that plague shots from small sensors), and a shallower depth of field. Depth of field control is what lets photographers do things like put someone's face in sharp focus while blurring the background.

APERTURE

 Aperture is the hole in the lens that lets light through. The bigger the hole, the more light, and the more angles through which light can enter. On cameras this is measured in focal length, or f-numbers (f/1.8, for example), where lower numbers represent a larger hole (for instance, f/2 is significantly larger than f/4). Lenses with lower f-numbers are better for shooting in low light, and for controlling depth of field.

OPTICAL VIEWFINDERS

 The optical viewfinder is the eyepiece you look through to frame a shot. Photographers are increasingly forced to rely on the large displays (digital viewfinders) on the back of the camera to frame their shots, which wash out in bright light and don't provide the color range or clarity of an optical viewfinder.

IMAGE STABILIZATION

► Unless you plan to shoot with a monopod or tripod, image stabilization is a key feature. This technology reduces or eliminates the small motions inside the camera or camcorder, where images are recorded. The best form of this is optical image stabilization, where lens elements move opposite to the motion to cancel it out. Many camcorders offer a much less expensive version called digital image stabilization. The image is zoomed slightly, and a program in the camera then does all the work of making sure the center portion of the frame remains stable even though the camcorder body is shaking.

ZOOM

► If you're buying a camera with interchangeable lenses, you can get anything from a fixed "prime" lens with no zoom to a massive telephoto with a tremendous range. Cameras with integrated lenses vary wildly in their zoom abilities, ranging from 3x all the way up to 30x and beyond. When comparing zoom levels, don't look at the "x" number, but instead use the "35mm equivalent" ratings: Lower numbers are better when you want a lens that can shoot wide or panoramic shots, and higher numbers are better when you need something that can shoot extremely distant subjects. For example, a superzoom with a 24-720mm 35mm-equivalent lens can back off for a wide shot or zoom up to 30x. Be aware that higher zoom levels decrease the amount of light that is let in and magnify camera shake, making it important to use image stabilization or a monopod/tripod.

FOCUS

► Nearly all cameras and camcorders sold today have autofocus, but if you want total control look for a model that allows for manual override. Focus modes that can lock in on a subject and adjust as the subject moves are important if you plan to take action shots.

If you use a camera with interchangeable lenses, note that not all of them have their own autofocus motors, and all of them will autofocus a bit differently. The sharpest lens on the planet is worthless if you can't focus with it, so test them out at the store whenever possible before buying.



CONTROLS

► Many consumer-level cameras favor ease of use over too many controls, but that isn't always a good thing. Ideally, you want a full manual mode with separate controls for ISO, shutter speed, and aperture. ISO adjusts how sensitive the camera sensor is to light; higher numbers make it more sensitive but also contribute to image noise. Shutter speed adjusts how long light is let into the camera; higher speeds are needed to freeze fast action, and lower speeds are useful in dim lighting. Aperture adjusts the size of the hole that lets light in. Adjusting these elements lets you capture images in all types of lighting and timing conditions.

Not all cameras come with full manual modes, but most come with aperture-priority and shutter-priority modes. Aperture-priority lets you select the aperture and then the camera decides an appropriate shutter speed for a proper exposure. Alternatively, shutter-priority mode lets you choose how long to leave the shutter open, and the camera decides how big to make the aperture for proper exposure. Knowing the right mode to use in different shooting situations makes a big difference with quality.

VIDEO CAPABILITIES



Any camera or camcorder you buy should have 720p video capability, minimum; 1080p is preferred as that is the native resolution of most HDTVs. Some cameras and camcorders let you take still images while you record video.

MICROPHONES



Most cameras and camcorders come with stereo microphones, but often the quality is mediocre and there isn't a lot of stereo separation. They also tend to pick up wind and internal motor noise. For best quality, invest in an external microphone.

OUTPUT



Most computers and some TVs have memory card readers that can pull files off the camera's memory card. Most cameras also have USB (Universal Serial Bus) or HDMI (High Definition Multimedia Interface) ports that let you transfer images to a PC or TV via the proper cable.

DON'T FORGET THE EXTRAS

► Necessary accessories and extra features are often overlooked when shopping. If you need to shoot underwater, for example, is a waterproof housing available? Do you need an integrated GPS to geo-tag shots so you know where they were taken? Do you need lenses and bodies that are rugged for demanding outdoor shoots? A Steadicam attachment for your camcorder? Multiple external flashes to do complex lighting for real estate shots? Make sure everything you need is available before you make an expensive mistake. ●

Resolving remote network issues often goes beyond common fixes

you may have used to fix your Internet connection. Fortunately, you can quickly eliminate a number of possibilities using a CLI (command-line interface; a text-based command window that is a holdover from the early days of computing), which is still available in Windows XP/Vista/7.



Solve Remote Network Connection Problems

ALL THESE SUGGESTIONS assume that the network is up and operating. It also assumes you are connected to the Internet. Before you proceed, you'll need to know how to open the CLI window. In WinXP, click Start, select Run, type **CMD** in the Open field, and press ENTER. In Vista/Win7, click the Start button and type **CMD** into the Start Search field, and then click the CMD icon that appears in the results.

PING IT

All Internet or network hosts, computers, routers, and numerous

other Internet-enabled devices use an IP address (which is a string of four groups of numbers separated by periods, such as 233.122.0.2) to uniquely identify themselves. You may have used this number to access a network login. This can also be a Web address (called a host name) or DNS name to access a login. IP addresses and DNS names are interchangeable. With either, a ping command can determine whether the computer and network can exchange basic data.

From the command line window, type **ping** followed by a space and the

IP address or DNS name (examples would be **ping 167.154.16.27** or **ping www.corporatenetwork.com**). Press ENTER. If you see a time-out message, wait a few seconds. A time-out alert appears if the reply takes longer than a second.

If the response indicates that the data packets were sent and received, then your computer is exchanging data with the network address. You can skip to "Get Connected" to set up a dedicated connection and edit settings. If you've been accessing the site via a Web address, go to the "Look It Up" section before heading to "Get Connected."

Key Points.....

If you can send data packets but none are returned, it generally means the network is refusing to acknowledge your request.

Obtaining the DNS name and IP address and comparing access times between the two can determine whether Windows is experiencing DNS resolution issues.

The point at which a route trace hangs can help you determine where your request for network attention is being disrupted.

If you receive a response that contains something about a nonexistent domain, you are likely using the wrong IP address or DNS name to log in. Double-check the address and try to connect normally. (If you are logging in with an IP address, skip to “Look It Up” for a quick way to check its validity.)

If you receive a transmission error, then the ping data is not leaving your PC. Your firewall is likely blocking you from accessing the network. You will want to add the site to your firewall as an allowed exception (refer to your firewall’s help documentation for these instructions) and try again.

If you receive a response after an excessive number of time-outs, the network’s response to your connection may be slow and your browser or other network access utility may be giving up before it connects. Lengthen the response time by adding a -t switch (ping -t followed by the IP address or DNS name). This will ping the address indefinitely. After a dozen pings, press CTRL-Break to view the packet data. If there is no response yet, continue awhile longer, and then press CTRL-C. If you never get a response or the number of pings to get a response is considerable, skip to the “Trace the Route” section for assistance.

If you get a message saying the ping request couldn’t find the host or the response indicates the number of data packets sent is zero, the network is not acknowledging your ping. Changes to the network or configuration may be preventing access. You’ll want to contact the network administrator for further assistance.

LOOK IT UP

You can look up a DNS name from an IP address and vice versa. From the command line window, type **nslookup** followed by a space and either the DNS name or the IP address and press ENTER.

Write down the DNS name and numeric sequence you see in the lines

that begin with Name: and Address: (ignore aliases). If you are checking an IP address, the DNS name should help confirm it. If you recognize nothing, contact the network administrator to confirm the IP address.

If you are using a DNS name, Windows may be having a problem with DNS name resolution (translating the DNS name into an IP address). Perform two pings from the same command line window, first using the DNS name you wrote down and then using the IP address. Compare the access times and packets you sent and received. If there is a big difference in behaviors pinging the DNS name vs. the IP address, skip to “Get Connected.”

TRACE THE ROUTE

Tracing the path data packets take going to the network will help pinpoint problems. From the command line window, type **tracert** followed by a space and the DNS name or IP address, and press ENTER. Lines will appear with access times and IP addresses. The final few hops should show domain names—the last one being your network. This is the route—and the time the trip is taking—between nodes on the Internet.

If an early hop takes a long time or causes the trace to hang (a flood of time-outs), contact your ISP. If you reach many hops before things go awry, the problem may be with a gateway or router at or near the location of the remote network. Check with the network administrator for assistance.

GET CONNECTED

Setting up a direct VPN connection gives you a dedicated login interface and lets you avert DNS issues.

To set up the connection in WinXP, select Control Panel on the Start menu. Click Network And Internet

Connections and then select Create A Connection To The Network At Your Workplace. In Vista/Win7, click Control Panel on the Start menu and click Network And Internet (in Category view), then Network And Sharing Center. Click Set Up A Connection Or Network (Vista) or Set Up A New Connection Or Network under Change Your Network Settings (Win7). Select Connect To A Workplace, then Use My Internet Connection. (Vista/Win7 offers smart card as a connection option, but we won’t discuss that here.)

Select Virtual Private Network Connection, name the connection, and provide the host (DNS) name or IP address. If you are asked if you would like to dial a connection, click No (unless you only have dial-up Internet) and click Finish (WinXP) or Connect (Vista/Win7). The OS will attempt to connect you without configuring any settings. If this solution does not work, or if you are using WinXP, proceed with the following instructions.

Return to the Network Connections window in WinXP or the Network and Sharing Center in Vista/Win7 and click the option to manage network connections. Right-click your VPN network icon and select Properties. Next, click the Networking tab, click Internet Protocol (in Vista/Win7, you will need to do this for TCP/IP V4 and TCP/IP V6), and then click Properties. Override automatic configuration and provide the exact IP address and DNS names for the network. Exit the Properties interface, right-click the VPN icon, and click Connect. Provide your login information if prompted.

If you can’t connect, then Windows can provide assistance, but you may need more advanced configuration information. You will need to contact the network administrator for detailed information. ●

Tracing the path
data packets take
going to the
network will help
pinpoint problems.

■■■■■■■■■■

The scramble for companies to leverage Wi-Fi to boost bottom lines

and customer loyalty has resulted in a confusing number of service configurations. Here's the rundown on some issues you will encounter—and also how to connect in the wisest manner possible.

■■■■■■■■■■



Use Wi-Fi Hotspots Wisely

THE UGLY FACT IS that someone with enough skills and determination can hack into any network, and all but the most secure, private connections can be hacked by someone of average skill and enough determination. Consequently, the most important thing you can do to use Wi-Fi hotspots wisely is to lock down your data and system.

HOW TO PROTECT YOURSELF

We urge you not to surf without a firewall. If you do not have firewall software installed, turn on Windows' built-in firewall protection. Because many users have third-party firewall software installed, we won't detail these instructions here. You can locate available firewall programs by browsing to windows.microsoft.com and searching for Firewall (your version of Windows).

The next step is to secure your data. Windows Vista and Win7 give

you the option of selecting a network profile (Home, Work, or Public) when you connect. Always select Public unless you trust the network and its members. Doing this prevents other computers on the network from discovering your PC and turns off the File And Printer Sharing feature. You can tweak any of these settings in the Network And Sharing Center: Right-click the network icon (a monitor or series of bars, potentially with a red X or starburst on top) at the bottom right of your display. Select Network and Sharing Center in Vista; Open Network And Sharing Center in Win7.

In WinXP, File And Printer Sharing is turned off by default. To enable this feature, right-click the network (monitor) icon at the bottom right of your display and select Open Network Connections. Right-click the icon for your wireless device and click

Properties. Under the General tab, deselect the File And Printer Sharing For Microsoft Networks checkbox to turn sharing off globally. When you return to a safe environment, you can re-enable this feature when necessary. In Vista/Win 7, you can also turn off the File And Printer Sharing feature manually through the OS's Network Connection Properties feature, but it's easier to let Windows do it for you.

HOW TO CONNECT THROUGH WINDOWS

To connect to a wireless network, right-click the network icon and then select View Available Wireless Networks (WinXP) or Connect To A Network (Vista). In Win7, select the Network icon.

A menu will pop up displaying available networks. Each OS will identify whether networks are secure. If the network you want is open, select

it and click Connect. We advise not connecting to an open network unless you know it is the one you seek. Hackers set up open networks with friendly sounding names hoping that unsuspecting individuals will hop onto them.

If you are connecting to a secure network, or if you don't know the name of the network you want, contact the network host. You'll need the network name (also called a service set identifier or SSID) and, if the network is secure, a security key or passphrase. Select the desired network and provide the key if prompted. (See the "How To Evaluate Security" section before you complete this step.)

If you use WinXP, your network card may manage network connections, leaving you unable to connect using our instructions. To give Windows control, click Start, select Control Panel, click Network And Internet Connections, and select Network Connections. Right-click your wireless connection and click Properties. Click the Network Settings tab and select the Use Windows To Configure My Wireless Network Settings checkbox.

HOW TO SET UP A MANUAL CONNECTION

If you cannot locate the network you want (because some networks

choose not to broadcast their SSIDs), you can set it up manually. In addition to the network, name, and credentials, you will need the network security protocol and encryption type (TKIP or AES).

To set up a manual connection in WinXP, open the available networks list as described previously and click Advanced or Change Advanced Settings (depending on the service pack that you have installed). On the Wireless Networks tab, click Add. In Vista/Win7, open the Network And Sharing Center. In Vista, click Set Up A Connection Or Network at the top left of the display; in Win7, click Set Up A New Connection Or Network (under Change Your Network Settings). Select Manually Connect To A Wireless Network and click Next.

Provide the information exactly as you were given it (uppercase and lowercase). In Vista/Win7, you can opt to see the characters as you type for confirmation. If the network is WEP and you don't see this option, select Shared. Select an encryption type or keep the default. After entering all this information and configuring

the desired settings, click OK or Next to connect.

HOW TO EVALUATE SECURITY

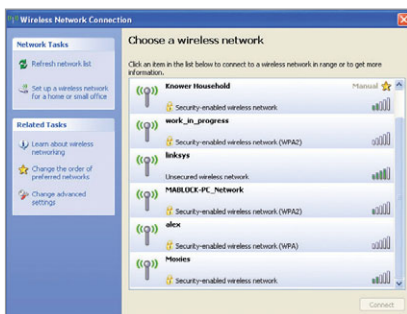
Most private, as well as some public, networks use one of several security standards to protect users and themselves from intrusion. You will encounter WEP, WPA, and possibly WPA2. The Wireless Network Connection dialog box may provide the network type. If not, here's a hint: WEP security keys always contain 26 characters; WPA and WPA2 security keys are eight to 63 characters in length.

WEP is the least secure and easiest to crack; treat a WEP network as you would an unsecure network, setting its profile to Public unless you absolutely must communicate with other PCs. WPA and WPA2 are more impervious to cracking, so you can use a profile that is more open, such as Work, if necessary (or tweak the settings in the Public profile to open things up as needed).

TAKE CHARGE

At the end of the day, the responsibility for protecting your assets lies with you. Using common Internet precautions is also a good idea. Before you provide sensitive information, be sure you are at a secure site. The Web address should begin with "https" instead of "http," and your browser should display a padlock icon or other security confirmation. Check with your email provider to see if you can encrypt your email messages. Another precaution you can take is to turn off your wireless adapter when you are not using the Internet. To turn wireless off, right-click the icon for your wireless connection in the System Tray and select Disable. ●

Most private,
as well as some
public, networks
use one of several
security standards
to protect users
and themselves
from intrusion.



Windows XP/Vista/7 all provide a wireless connection display that lets you determine if a network is secure or open (WinXP displayed).



In Vista/Win7 the Network And Sharing Center is your portal to setting up new connections, changing network profiles, and more.

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You're ready to give
your presentation,

but until that first slide appears on the big screen, you can never be sure that your equipment has got your back. We can't tell you not to worry, but these handy tips should help bail you out if your presentation goes south.

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Solve Notebook-Projector Setup Problems

GET CONNECTED: THE BASICS

MAKING THE CONNECTION between your notebook and your projector can sometimes be the hardest part of setting up your presentation. Not because it's difficult to do, but because when it doesn't work, you are left scratching your head wondering how such an easy thing can go wrong.

Video. Turn off all equipment and connect your notebook's video out port to the projector. The usual connection choices for a notebook are VGA (Video Graphics Array), DVI (Digital Visual Interface), HDMI (HD Multimedia Interface), and Display-Port. Many projectors have VGA and one or more digital connections, such as DVI or HDMI. When possible, use a digital connection for a high-quality presentation.

Sound. Some HDMI and Display-Port digital video connections can carry the audio through the same port,

but both the notebook and the projector must support audio over the digital video connection.

Traditionally, audio is connected using the notebook's audio out jacks (RCA jacks or a 3.5mm stereo headphone jack) and the projector's audio in ports (often RCA jacks or 3.5mm jacks).

If you're not using the projector's built-in speakers/audio system, make sure you connect your notebook's audio out to the sound system you intend to use and turn the volume down on the projector's speakers.

Mouse. If you are using a mouse, or a remote mouse controller, make sure the controller/mouse is connected, usually through the notebook's USB port. If you are using a wireless mouse/controller, make sure the notebook has the appropriate wireless connection enabled. This is typically Bluetooth or a USB port wireless dongle.

GET CONNECTED: NETWORK PROJECTORS

Many corporate venues supply network projectors, which are connected to the company's network and are made available as a shared resource. Making a connection to a network projector is as easy as plugging your notebook into the corporate network via wired or wireless Ethernet. Check with the company's IT staff for specifics.

Once connected, you can use the network connection wizard in Vista or Windows 7 (not available in Windows XP) to find the projector you wish to use. Select Start, All Programs, Accessories, and Connect To A Network Projector. When you run the connection wizard, you may be informed that your notebook's firewall is blocking the ability of the projector to make a connection; click the button to allow the network connection to be made.

You can either have the wizard search for available network projectors or enter the projector's address manually if it is available. After you make the connection, a Network Presentation window will minimize to your Taskbar. When you're ready to make your presentation, open the Network Presentation window and select Resume. Your notebook will treat the network projector like an external monitor.

VIDEO IS MISSING

In many cases, your notebook will detect that you have a projector plugged into one of its video outputs and will automatically turn on the port. Not all notebooks do this, however; and even those that do can still have missing video if the notebook isn't set to duplicate the Desktop or extend it to the secondary monitor (the projector).

Many notebooks use a function key combination to toggle the projector port on or off and set how you can use the display. We prefer to use the control panels in Windows to perform this function rather than pressing random key combinations in the hopes we find the right combination.

In WinXP, right-click a blank area on the Desktop, select Properties, and click the Settings tab in the Display Property dialog box. In Vista, right-click a blank area on the Desktop, click Personalize, and select Display Settings. In WinXP/Vista, select the second display in the drop-down menu. Place a check mark next to Extend My Windows Desktop Onto This Monitor. Click Apply. Your Desktop background should now appear on the projector.

In Win7, right-click a blank area on the Desktop and select Screen Resolution. Select the second display from the Display drop-down menu

and select Extend These Displays from the Multiple Displays drop-down menu. Your Desktop background should now appear on the projector.

Win7 also has a pop-up display for selecting the content that is sent to the projector. Press the Windows-P keys to bring up the four possible selections: Computer only (turns the projector display off); Duplicate (mirrors your computer's Desktop on the projector); Extend (uses the projector as an extension of your Desktop); and Projector only (turns off your notebook's display and uses the projector as the main display).

You can either have the wizard search for available network projectors or enter the projector's address manually if it is available.

VIDEO IS OUT OF RANGE

You'll see an out-of-range message when the projector is expecting a video signal from your notebook to comply with the projector's preset resolution. When the projector can't make heads or tails of the signal, it displays an out-of-range message.

Right-click a blank area on your Desktop. In WinXP, select Properties and click Settings in the Personalization window. In Vista, select Personalize, and click Display Settings in Display Properties. In Win7, select Screen Resolution from the pop-up menu. Next, use the drop-down menu

in WinXP/Vista/7 to select the display associated with the projector, usually the second monitor.

Use the resolution slider (WinXP/Vista) or the resolution drop-down menu (Win7) to adjust the resolution to the correct value; try 800 x 600 or 1,024 x 768 as these are fairly common resolutions that most projectors can handle.

KEYSTONE IMAGES

Keystoning occurs when the projector isn't perfectly perpendicular to the screen. Try repositioning the projector to get it as perpendicular as possible in the horizontal and vertical axis. If the image is still a bit bent, use the projector's keystone adjustment.

DISPLAY TURNS OFF

If the projector's display turns off during your presentation, check your notebook's power management feature, especially if you're running the notebook off of its battery. Whenever possible, use your AC adapter to run your notebook.

VIDEO WON'T DISPLAY OR IS CHOPPY

Your slide presentation works fine, but when you try to show a video, all you see is a blank window or a choppy rendition of the video. Trying to display a video on two monitors can be too much for a video card that has marginal graphics capabilities. Try setting the projector as the primary display. ●



For the best audio quality, connect your notebook's audio outputs to the projector, which you can see on the back of this Epson EX7210 Multimedia Business Projector (www.epson.com), or to separate audio amplifiers/speakers. Don't use your notebook's headphone jack to make audio connections.

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You appreciate the
fact that Excel is a
power-packed program,

*but you are also a professional on the go,
and, frankly, you don't have a lot of time
to learn the finer points of the software. No
sweat. Read on and we will give you some
great ideas of how to kick up your Excel
skills a notch without spending a lot
of time doing so.*

.....



Excel In A Crunch

EXPLORE VARIOUS SCENARIOS

One of the most powerful things you can do with Excel is play around with worksheet values to answer “what-if” questions. What if sales decrease by 6% next year? What if the cost of goods sold increases by 3%?

To calculate multiple outcomes such as these, you can use Excel's Scenario Manager. This tool enables you to specify which data cells you want to change and then quickly view the result in the worksheet.

To use the Scenario Manager, select the cells you want to include in the scenario and then choose Tools and Scenarios. In the Scenario Manager dialog box, click Add to display the Add Scenario dialog box. Type a name (such as Status Quo, Worst Case, or Best Case) in the Scenario Name text box and then specify which cells you want to

change. Click OK and then enter a new value for each changing (variable) cell in the Scenario Values dialog box. Click OK, and the Scenario Manager dialog box will re-display with the new scenario shown on the list. Complete the same steps for each scenario you want to create. Finally, to switch between the scenarios, click each one's name in the Scenario Manager dialog box and view the change directly on your worksheet.

SELECT CELLS BY DATA TYPE

You can quickly locate all the cells in a worksheet that include a particular type of data, such as those that include comments or formulas. For example, if you want to identify cells

in a selected range that contain formulas, press CTRL-[(opening bracket); to find and select all cells with comments, press CTRL-SHIFT-O.

You can also highlight all the cells in a range that include objects, such as clip art, charts, or pictures. This helps you quickly identify all the items so that you can then apply actions to them, such as resizing, moving, formatting, or grouping them. To select all of a worksheet's objects, click one of them and then press CTRL-SHIFT-Spacebar.

FIND ANY TYPE OF DATA

You've probably noticed that it doesn't take long for a business worksheet to quickly mushroom in size, making



You can use Excel's Scenario Manager to help you make sound business decisions.

► ESSENTIAL FUNCTIONS

We compiled a list of some of the most-used Excel functions and a brief explanation of their purposes. If you need more guidance using these functions, consult Excel's Help feature.

SUM Totals the values in a range.

AVERAGE
Averages the numbers in a range.

MAX Returns the maximum value in a selected range or set of numbers.

MIN Returns the minimum value in a selected range or set of numbers.

DATE Returns the serial number associated with a specific date. This function is often

used to calculate
the number of days
between two dates.

COUNT Returns the number of cells that contain data in a range.

IF Returns one value if a specified condition is “true,” a different value if the condition is “false.” Helps you create various “what-if” scenarios and logically evaluate data.

ROUND Rounds values to a specific number of places.

it almost impossible to find data by simply scrolling. This is especially true when you're working on a laptop with a relatively small screen. It's also an inefficient way to find, let's say, one customer's name among several hundred. But help is at hand in the form of Excel's Find command.

To use this command, first select the range in which you want to look for the data (or select a single cell if you want Excel to search through the entire worksheet). Choose Edit and then Find or simply press CTRL-F to open the Find And Replace dialog box. Enter the text that you want to locate, and then click Find Next to highlight the next cell with your data; click Find All to display a list of cell references that contain the search text.

By default, Find searches through cells with values, such as text or numbers. But you can also locate information buried in worksheet comments, even if it is not displayed. To do this, click the Look In drop-down arrow in the Find And Replace dialog box and then choose Comments from the list.

ADD COMMENTS

You can easily add comments to an Excel worksheet, either for your own future reference or to share your ideas with others. Right-click in the cell where you want to place the comment and then choose **Insert Comment**. Type your notes in the comment box and then click outside of it.

If necessary, you can edit the contents of a Comment by right-clicking the cell, selecting **Edit Comment**, and then modifying the text as you would in a word processor. You can also hide, show, or delete a comment by right-clicking the cell that contains the Comment and then choosing the appropriate command on the displayed list.

REPLACE DATA & FORMULAS

In addition to helping you locate data, Excel can help you rapidly replace formulas, numbers, or text with other data. For example, you can update a name that appears multiple times in

a worksheet. To do this, choose Edit and then Replace or press CTRL-H. In the Find And Replace dialog box, enter data in the Find What and Replace With fields. Click Find Next, decide if you want to replace the selected occurrence, and then choose Replace. (If you're feeling especially brave, you can instead choose Replace All without looking at each occurrence.)

CALCULATE VALUES ON THE FLY

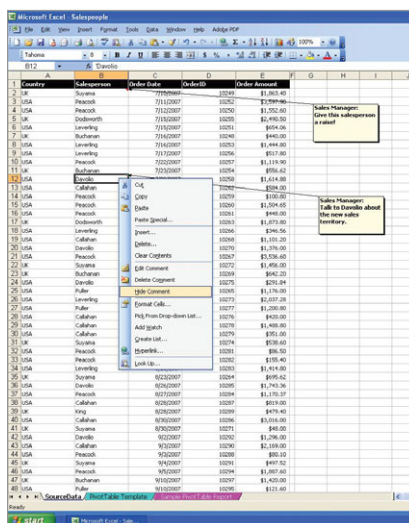
You can quickly calculate and display information about a selected group of values on Excel's status bar, which is located at the bottom of each worksheet. To do this, select the cells you want to add and then view the total on the status bar. But don't stop there. You can also display a wealth of other information about a selection by right-clicking the status bar and then choosing functions such as AVERAGE, MIN (minimum), or MAX (maximum) on the pop-up menu.

TAKE A SHORTCUT

You're probably already familiar with many basic Excel keyboard shortcuts, especially when you take your laptop on the road and don't want to use the mouse. However, there are some little-known shortcuts that can help you work even more efficiently in selecting ranges and moving around a worksheet.

For example, you can quickly select an entire data region (a range of data cells bordered by empty cells) by holding down CTRL-SHIFT-* (asterisk). Another way to select a data range is to place your cell pointer in the range and then press CTRL-A; press CTRL-A a second time to select the entire worksheet. You can also press CTRL-Spacebar to select the column where your cell pointer is located.

Another helpful keyboard shortcut is to press **END** followed by an Up, Down, Left, or Right arrow key to efficiently move the cell pointer to the outermost edge of a data range. ●



You can use comments to jot down electronic notes on your worksheet.

It's obvious that
notebooks are
designed differently

*than their desktop cousins, but that
doesn't mean you cannot perform a few
minor tweaks with reasonable ease.*



Troubleshoot Notebook Problems

WE EXPLORED some common notebook operating issues and their fixes. All the routines assume that Windows is fully updated (visit www.update.microsoft.com for current updates) and the problem is still occurring. If an item requires shutting down your system and you cannot do that, press and hold the power button for five seconds.

HOW TO TROUBLESHOOT UNEXPECTED PC REBOOTS

Unexpected (also called uncommanded) PC reboots usually occur because your Windows OS is set by default to reboot upon system failure. A reboot can also occur because an update restarts the system automatically, but this is something you should be warned about. If you weren't installing updates prior to the reboot, you should determine the cause of the system failure before things get worse.

An infrequent, but possible, problem is BIOS incompatibility. If you upgraded to a new version of Windows on an older notebook, check with the manufacturer to see if you need a BIOS update.

Another cause of reboots is software or hardware bugs or driver incompatibilities. If the problem began after installing new hardware or software, or when you open a particular program, check with the manufacturer/developer for an update.

Other culprits of reboots during system operation are power or heat. We recommend professional servicing for power problems. However, heat build-up is something you may be able to resolve yourself.

HOW TO PREVENT OVERHEATING

Locate the air vents and don't rest your notebook on anything that blocks them. Also, check for dust blocking the

vents. With the machine powered off and the battery removed, try to extract dust with tweezers or a cotton swab lightly dipped in alcohol. If the debris or dust is past the vent opening, a mini (USB) vacuum will be helpful. We don't recommend compressed air at this step, because it can spin your fan blades excessively and cause damage.

If this doesn't resolve the issue, consult your computer's service manual for cleaning instructions. If you can't locate these instructions and want to try this anyway, shut down and unplug the notebook, remove the battery, and remove any screws on the bottom that may enable you to access the inside of your computer. Ground yourself by wearing a grounded wrist strap or touching an unpainted surface frequently before you attempt to remove objects from the inside of the notebook. If you choose to use compressed air to clean out your system, place a toothpick

between two fan blades to prevent excessive spinning.

HOW TO TROUBLESHOOT SHUTDOWN ISSUES

If you recently installed new software or hardware and your computer won't shut down normally, it is possible that a driver or a process related to the new addition is causing the problem. Uninstall the new software or hardware. If your computer shuts down normally, you can consult the developer/manufacturer for a possible solution to the installation problem.

If Windows doesn't shut down when you expect it to, the solution may be as simple as adjusting your power settings. Right-click the battery icon in the System Tray and select Power Options. Tweak such settings as Choose What Closing The Lid Does.

HOW TO TROUBLESHOOT A DEAD NOTEBOOK

A dead notebook—one that fails to start (no BIOS messages) when you press the power button could be the result of a number of things. Check to see if the notebook starts when you plug it into the AC adapter.

If so, the battery is likely faulty. Remove the battery and replace it, making sure nothing is blocking the connectors. If that doesn't help, see if your notebook has a battery testing feature, such as HP's Battery Check. If the notebook won't start with AC power or a charged battery, continue reading.

Press the power button on the notebook and check for auditory and visual clues. Does the power light come on?

HOW TO TROUBLESHOOT POWER ISSUES

Press the power button on the notebook and check for auditory and visual clues. Does the power light come on? If so, the machine is getting power. If not, then your AC adapter and/or battery may be

faulty. Use a compatible AC adapter and see if you can start the machine; if so, leave the adapter plugged in to make sure the battery charges correctly.

HOW TO CHECK THE DISPLAY

If you have a working, but problematic, display, a number of issues could be at fault. Did you recently install a new video card or does the problem only occur when you run certain software? If so, you may need to adjust the video settings. Right-click an empty area of your Desktop, select Properties (WinXP), Graphics Properties (Vista), or Screen Resolution (Win7). The interface

will vary based upon your notebook model and graphics chip/card, but you should be able to tweak a number of settings. If you recently installed a video card, you may also need to consult its manufacturer for more information.

If the display is dim or goes blank unexpectedly, check the power options mentioned previously. Power saving modes can cause these behaviors. Also, ensure that your screen saver is not set to Blank.

For a blank display on boot, or if the previous solutions don't help, shut the system down and plug in an external monitor. If the external monitor display works, the notebook's video display may be faulty (this is rare unless there is visible damage). It's also possible a connection may be loose or damaged. If an external monitor doesn't work, the video adapter/chip may be faulty or unseated.

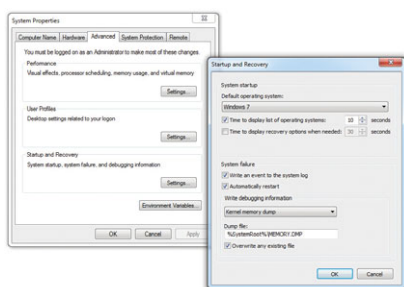
If the display is scrambled or fails over a long period of operation, one or more of your memory chips may have failed or the video processor may be overheating. Video failure can also occur when the entire notebook overheats (refer to "How To Prevent Overheating" for assistance). If the display looks like there is liquid spreading out, it probably needs replacing. If evidence points to the more serious issues mentioned in the last two paragraphs, consult your service manual.

HOW TO RESOLVE A FAILED OPTICAL DRIVE

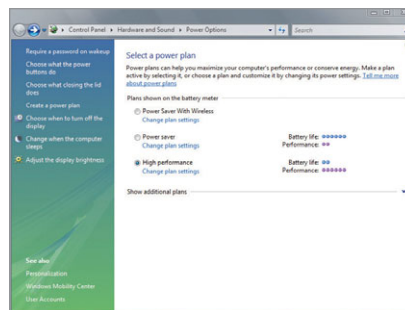
If your drive is removable, make sure it is properly seated (consult your documentation if necessary). You also may want to purchase a cleaner kit and clean the drive according to its instructions.

SERVICE IT

Many of these solutions direct you to the service manual. Notebooks vary in configuration, making it impossible to provide generic instructions. Search for a service manual for your specific notebook model. If you are not comfortable with or can't find instructions for repairs, seek professional assistance. ●



Windows XP/Vista/7 are set to reboot upon system failure by default, so a random reboot is a symptom of an underlying problem.



Some power and/or display problems can be attributed to incorrect power settings.

What should
you do when your
smartphone decides
to play dead?

*Resist the urge to throw it against
the nearest wall and try one of
these techniques instead.*



Revive A Dead Smartphone

SOFT RESET

ALL PHONES HAVE a soft reset function, which is similar to restarting your computer. Beware that a soft reset will cause you to lose data that isn't saved, but you will retain information previously stored on your smartphone.

► **Android.** Most Android models use a simple power cycle to perform a soft reset. Just turn the phone off and then back on again.

► **BlackBerry (QWERTY).** Press and hold the ALT-CAP-DEL keys. The display goes black and your phone resets.

► **BlackBerry (SureType).** Press the ALT-CAP and Right Shift-DEL keys. When the screen goes blank, release the keys.

► **BlackBerry (touchscreen).** Turn the BlackBerry off and remove the battery

for at least 30 seconds. Reinstall the battery and turn the device back on.

► **iPhone 4 and earlier.** Simultaneously press and hold the Sleep/Wake button on the top of the iPhone and the Home button. Hold both buttons for approximately 10 seconds, until the screen goes blank. You'll see the Apple logo as the iPhone reboots.

► **iPhone 4S.** Simultaneously press and hold the On/Off button on the top of the iPhone and the Home button. Hold both buttons for approximately 10 seconds, until the screen goes blank. You'll see the Apple logo as the iPhone reboots.

► **Microsoft Windows Phone 7 (all models).** Power the phone off and then back on. If the power cycle doesn't correct the problem, try removing the battery and replace it after 30 seconds.

► **Nokia (all models).** Power the phone off and remove the battery for 30 seconds. Reinstall the battery and power the phone on. Alternately, you can enter the code *#7380# and select Yes.

► **Palm Pre.** If the phone's menus are active, select Device Info, Reset Options, then select Soft Reset. If it is locked or frozen, hold the power button and cycle the ringer button on and off three times. If that doesn't work, press and hold the Orange, Sym, and R keys until the device reboots. Turn the phone off, remove the battery for 10 seconds, reinstall the battery, and power the phone up.

► **T-Mobile myTouch 4G Slide.** Unlock the display. Press and hold the Power/Lock button and then tap Restart. When asked to confirm, tap Restart again. If the phone doesn't restart, remove the batteries for 30 seconds.

➤ **All other smartphones.** You can generally perform a soft reset by powering the phone off, removing the battery for 30 seconds, and powering the phone on.

HARD RESET

A hard reset is a last-ditch option that returns your phone to its factory settings, which means you will lose all data and installed applications. Before you perform a hard reset, remove the memory card from your phone; that way you can recover data from the card later.

➤ **Android (all models with functioning menu systems).** One of the following menu-based systems for performing a hard reset should work, depending on the phone and version of Android. Open the application menu. Tap Settings, SD and Card Storage, Factory Data Reset, and follow the on-screen instructions.

- From the Home screen, you'll want to tap Menu, Settings, Privacy, and Factory Data Reset, and then follow the on-screen instructions.
- From the Home screen, you'll want to tap Menu, Settings, Security, and Factory Data Reset, and then follow the on-screen instructions.

When the menu system isn't functional, follow these phone-specific options to perform a hard reset.

➤ **BlackBerry (all models).** Remove the battery for 30 seconds. Reinstall the battery and turn the phone back on.

➤ **BlackBerry Style, Bold, Storm, Curve, Tour, Torch.** Click the Options icon on the Home screen. Select Security and then Security Wipe. Select all three of the available checkboxes to perform a complete wipe and reset the device to factory condition. Type the word BlackBerry and click Wipe.

➤ **Dell Venue.** With the device turned off, press and hold the Volume Up and Volume Down buttons. Without releasing the buttons, press and hold the

Power button. When the device configuration screen appears, release all buttons. Use the Volume Up or Down button to move to Factory Reset. Press the Camera button to select the Factory Reset option and start the reset process.

➤ **Google Nexus One, Nexus S.** Turn the phone off. Press and hold Volume Down while you press and release the Power button. Use the Volume Down button to select Clear Storage from the list of options. Press the Power button, and confirm your selection by pressing the Volume Up button.

➤ **HTC Arrive, HD7, Surround.** Press Start and tap the right-facing arrow. Tap Settings, About, and then tap Reset Your Phone. Tap Yes, and then tap Yes again. If the screen is frozen, turn the device off. Press and hold the Volume Up-Down buttons and briefly press the Power key. When the screen displays instructions for resetting the device, release the Volume Up-Down buttons.

➤ **iPhone (all models).** From the Home screen, tap Settings, General, Reset, and Reset All Settings. This resets all preferences but retains applications and data. If that doesn't work, from the Home screen, tap Settings, General, Reset, Erase All Content, and Settings. This will delete all data and applications and return the iPhone to factory conditions.

➤ **Microsoft Windows Phone 7 (all models).** Press Start and tap the right-facing arrow. Tap Settings, About, and Reset Your Phone. Tap Yes, and then tap Yes again.

➤ **Motorola Droid.** Turn the phone off. Press and hold the Power-X keys to force the phone into recovery mode. Next, press and hold the Volume Up-Camera key, select Wipe Data/Factory Reset, and then select Reboot Phone.

➤ **Motorola Droid Pro, Droid 2 Global, Droid 3, Droid Bionic, Droid Razr.** On the Home Screen, open the App

menu and select Settings, Privacy, and Factory Data Reset. When prompted, tap Reset Phone to erase all data and return phone to factory conditions.

➤ **Motorola Backflip.** Power the phone off. Press and hold the Power and Camera buttons. When the phone turns on, release the Power button but continue to hold the camera button until prompted to release it. Next, press the Volume Down button. After about 15 seconds, a yellow triangle with an exclamation point will appear. With your phone closed, tap the bottom-right corner of the display and select Wipe Data/Factory Reset. Press OK and follow the on-screen instructions.

➤ **Nokia (all models).** With your phone powered on or in standby mode, type *#7370# and select Yes, when prompted. You may need your Lock Code for confirmation. The default lock code is 12345. If your phone doesn't turn on, try pressing the On/Off button, *, and 3 simultaneously.

➤ **Samsung Galaxy Nexus (Android 4.0).** Turn off the phone. Press the Volume Up and Power buttons. When the Recovery Menu appears, use the Volume Down button to select Recovery, and then press Power. The phone will reboot; this process can take a bit of time. If the phone fails to reboot, remove the battery, wait about 30 seconds, and then reinsert the battery.

➤ **T-Mobile G2x.** If possible, back up your data to Google's servers by selecting Privacy from the Settings screen. Select the Back Up My Data option. When the backup is complete, power off the phone. Press and hold the Power/Lock-Volume Down keys for at least 15 seconds. The phone should turn back on and perform a factory reset. If the screen is frozen, or the phone doesn't turn back on, remove the battery, wait 30 seconds, then reinstall the battery and try again. ●



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IPAD 3 HITS THE MARKET

► Apple put on another show in March when it announced and launched the iPad 3. Although Apple's newest iPad looks identical to the iPad 2, there are some key improvements that set it apart. For instance, the iPad 3 has a Retina display feature, which Apple previously added to its iPhone 4 and 4S; an improved A5X chip with quad-core graphics that supports the Retina display for detailed images and videos; a 5MP iSight camera; and support for 4G LTE networks. Apple also beefed up the battery on the iPad 3, providing users with power for as much as 10 hours whether they are listening to music, watching videos, or surfing the Web via a Wi-Fi connection. The iPad 3 is available in 16GB, 32GB, and 64GB models, with or without 4G LTE support, starting at \$499.

NOKIA'S NEW MANGO SMARTPHONE

► Nokia's Lumia 900 (nokia.com) is a Windows 7.5 (aka Mango) smartphone designed for personal and business use. The phone sports a 4.3-inch AMOLED glass touchscreen, an 8MP camera, and 16GB of built-in memory, plus support for SkyDrive cloud storage. The Lumia 900 is an ideal choice if you regularly listen to music or watch videos on your phone because battery life registers 60 hours for music playback and 6.5 hours for video. It is also a social networking machine, letting users quickly access Facebook, Twitter, LinkedIn, and other services. Business professional will find a lot of appealing features, as well. The Lumia 900 features built-in navigation for business travel; Internet Explorer 9 for fast Web browsing; Outlook Mobile email; and support for PDF, PowerPoint, Excel, Word, and OneNote documents.



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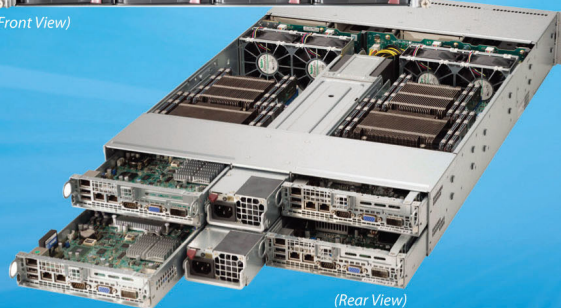
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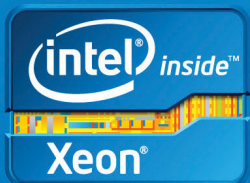
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